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Worldwide Report

ENVIRONMENTAL QUALITY

No. 274

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ENVIRONMENT COUNCIL RECEIVES REPORT ON POLLUTION

Sydney THE SYDNEY MORNING HERALD in English 2 Sep 80 p 1

[Article by Patrick Walters]

[Text]

CANBERRA. — The planned introduction of lead-free petrol in NSW has been strongly backed by a national inquiry.

A report to the Australian Environment Council has found that the introduction of lead-free petrol would control airborne lead almost completely eventually.

It would also lead to a "substantial improvement in fuel economy" especially in the long term.

The 25-page report, made public yesterday, also found that lead and ozone levels above Sydney exceed recommended safety limits and that the presently accepted safety levels may have to be reduced in the light of the latest medical research.

However, the report, which goes to State and Federal environment ministers, warned that it was doubtful that a national non-uniform approach to lead-free petrol would obtain the objectives of energy savings, minimum costs and health and environment protection.

Strategies To Cut Emissions

The report on future lead and emission controls by the Vehicle Emissions and Noise Standards Advisory Committee was commissioned by the Australian Environment Council.

The council is made up of the country's environmental ministers.

The committee's members were drawn from the Federal and State Government depart-

ments responsible for the environment.

The report examined options available to governments for the further lowering of vehicle exhaust emissions in those States that require it.

Reductions in the lead concentrations of petrol and greater control of hydrocarbon emissions from motor vehicles were essential, the report said.

There were three strategies

for the reduction of lead emissions from vehicles using leaded petrol:

Further reduction in the maximum level of lead in petrol used in large cities.

Use of lead traps on all new vehicles with no further reduction in lead levels.

Use of lead-free 92 octane petrol with the requirement that after a certain date all new petrol engine vehicles be designed to use this fuel.

Lead Trap of Doubtful Value

The report said that placing a lead trap on the exhaust was considered to be of doubtful value on "economic and efficiency grounds."

On the third option, the report said that energy penalties formerly associated with the removal of lead applied where the octane number was kept at 97.

But now as improved engine technology was adopted by the motor vehicle industry, the overall fuel economy offered by lead-free 91/92 octane petrol made the third option "not just viable but desirable."

Other technologies such as "clean" engines were available and their more widespread use might help in short-term reduction. But "the lower limits of emission being sought cannot be attained."

The major motor vehicle manufacturers have said that lead-free petrol and catalyst emission control technology would result in overall fuel savings.

"Australia will increasingly use engine designs from Japan and North America where unleaded petrol and catalysts are the rule. Optimum engine performance will only be achieved under their original design."

The proportion of such engines in new cars is around 30 per cent of the Australian market.

"If Australia continues to use leaded petrol, the catalysts cannot be used and local suppliers must retune these engines to a less efficient level," the report said.

"The cost of lead deposition and corrosion in the engine and exhaust system which the

motorist presently bears would be avoided.

"Australian motor vehicle manufacturers have expressed the view that it will be uneconomic to produce leaded and unleaded technology vehicles and or to produce vehicles to meet different emission standards," the report said.

A spokesman for the NSW Minister for Planning and Environment, Mr Bedford, said all State ministers and the Federal Minister agreed to the NSW case for lead-free petrol.

But some ministers requested a deferment of the decision pending future reports on emission controls.

The NSW Government decided in July to require that 92-octane, lead-free petrol be available in the State from July 1, 1984.

It was immediately subjected to criticism from the oil industry, car manufacturers, the Federal and other State governments.

Announcing its decision, the Government also foreshadowed moves to force local car manufacturers to fit catalytic converters to car exhaust systems to curb lead and exhaust emissions from 1984.

Car manufacturers expressed concern that the cost of the catalytic conversions required for lead-free petrol—estimated at between \$160 and \$300—would damage further the depressed car market.

Oil industry spokesmen argued that lead was the only material available to extend the yield per barrel of crude oil.

FRASER ISLAND DECISION 'MISUSE OF FEDERAL POWER'

Brisbane THE COURIER-MAIL in English 11 Aug 80 p 4

[Editorial: "A New Policy on Mining?"]

[Text] **T**HE Federal Government apparently has had second thoughts about its policies on mining and the environment.

That is the only conclusion to be drawn from the statement of the Deputy Prime Minister, Mr Anthony, that mining projects stopped by environmental objections might get going again. A minister of his seniority scarcely would make a remark like that unless it reflected government thinking.

The Deputy Prime Minister believes that the public is now better educated on environmental matters than it was when restrictive decisions on mining were taken some years ago.

Probably he is correct. It is open to doubt, however, whether the result of this greater public awareness is a more tolerant attitude to mining.

There have been, as Mr Anthony suggests, improvements in what mining companies have done to rehabilitate mined areas. This has been largely a response to public demand.

Mining companies now are well aware that if they want to mine they must do so within a framework of reasonable protection of the environment. Otherwise enough members of the public will kick up a fuss.

This does not mean, of course, that there is no place for mining. Conservation and mining must come to terms, and find a means of peaceful co-existence.

Mr Anthony's statement has been interpreted as referring to Fraser Island sand mining, effectively stopped in 1976. This was an unusual case in which the Fraser Government used its power over overseas trade to provide an export ban to meet a distant environmental aim. But had Fraser Island been off the coast of Victoria the decision might have been different.

The decision was a clear misuse of federal powers, even if the result pleased conservationists generally.

Moreton Island

It is important that every case for sand mining should be judged on its merits.

Moreton Island is a case in point. The Cook report on the island's future is the product of a painstaking investigation by an impartial panel.

If this report is adopted a small amount of the island would be available for mining under strict conditions, and according to a fixed timetable. Ultimately most of the island would become a national park.

This report has not been accepted by the State Government although it was made public three years ago. The Liberal Party has accepted the recommendations.

This is a matter which mostly concerns the people of Brisbane. As the Liberal Party is the spokesman for Brisbane within the coalition its views on Moreton Island should be accepted by Cabinet... and before the next state election.

BRIEFS

CONSERVATION POLICY SCORED--The Federal Government couldn't care less about soil conservation, the NSW Minister for Agriculture, Mr Hallam, said yesterday. He said Canberra had totally disregarded its responsibilities to primary industry by not including the funding of a national soil conservation program in its Budget. Mr Hallam pointed out that in NSW the population would increase by 30 per cent by the end of the century and to meet this increase many thousands of hectares would have to be developed for more intensive agricultural use. But between 1970-79, almost 1.5 million acres of commercial agricultural land in NSW was lost to rural production, Mr Hallam said. The Federal Government's decision to ignore soil conservation in its Budget was doubly disturbing following its agreement in principle last year for Commonwealth assistance to accelerate soil conservation in the national interest, Mr Hallam said. This followed a joint Commonwealth-States study into the basis for a national soil conservation policy for Australia. This study found that half the rural lands in Australia required treatment for soil erosion, the Minister said. In its final report, the study recommended the Commonwealth provide additional funds to supplement State expenditures and enable the attack to be stepped up. [Text] [Canberra THE AUSTRALIAN in English 22 Aug 80 p 3]

RAINFOREST PRESERVATION--Conservation organizations have begun a major campaign to preserve the remaining rainforests of NSW. The organisations which met at Port Macquarie at the weekend, said yesterday that rainforest logging was the "number one environmental issue facing the NSW Government." They said they would suggest alternatives for the relatively few timber mills and employment opportunities for the workers affected by cessation of rainforest logging. Groups at the conference included the Australian Conservation Foundation, the National Trust, Total Environment Centre, Terania Native Forest Action Group, National Parks Association, Northern Rivers Environmental Group, Nature Conservation Council of NSW, Colo Committee, and the Collong Committee. The conference resolved that: All rainforest logging should stop. The NSW Government should assist affected mills to change to alternative timber resources. Mills quotas should be bought by the government where

necessary. A major reforestation program on the North Coast should be paid for by the government. The president of the North Coast Conservation Council, Miss Joan Staples, said: "The jobs that will be lost could be replaced in a North Coast reforestation scheme which is desperately needed for the long-term viability of the timber industry."

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RECENT ACHIEVEMENTS IN ENVIRONMENTAL RESEARCH DESCRIBED

Beijing HUANJING BAOHU [ENVIRONMENTAL PROTECTION] No 2, 1980 pp 1-2

[Article by Ke Huan [2688 3883]: "Great Strides in Environmental Research"]

[Text] Environmental pollution problems, if not solved or not solved well, will affect the rate of development of socialism, destroy this nation's reputation, and bring harm to the people's health. The goal of socialist construction lies in creating abundant material as well as cultural life for the people, providing a good living and working environment for the people, and protecting the people's health by continuously improving production power. Therefore, protecting the environment well and doing a good job of environmental protection research have become indispensably important items in the construction of socialist modernization.

In 1972, the Chinese Academy of Sciences began to organize scientific research personnel according to their field and began to participate in environmental protection research. Numerous works have been carried out under the local united organization. Later on, this nation's first special institute for environmental research--the Institute of Environmental Chemistry--was established. This nation's first environmental science development plan was published in 1977. By 1979, the environmental research work of the Chinese Academy of Sciences had gained sufficient strength through readjustment, reform, reorganization, and improvement, as well as through serving the national economy and national defense construction, while further grasping the importance of basics and improvement. Today, a multidisciplinary research troop (including chemistry, environmental geography, environmental biology, and environmental acoustics) consisting of several hundred specialists has been formed. In addition to the Institute of Environmental Chemistry, some 20 other institutes have each established a laboratory especially for studies related to this subject. This troop is quite formidable. It represents a lively force among a number of armies all over the country. This force is expected to contribute significantly toward the needs of environmental protection and scientific research as this nation undertakes construction of the four modernizations.

In recent years the Chinese Academy of Sciences, under a joint organization of concerned departments and local units, has achieved some definite results

which have not only practical significance but also academic value. Among these achievements are 20 items which received achievement awards from the National Science Conference, 2 which received National Invention second place awards, and 12 which received Important Technological Achievement awards from the Chinese Academy of Sciences.

Investigation of regional environmental conditions and the study of environmental quality are fundamental works of environmental research. This writer had participated in recent years in urban environmental studies in the western and southeastern suburbs of Beijing, Shenyang, and Nanjing, and has taken part in the investigation and evaluation of rivers, lakes, and oceans, including the government water systems, the Ji Canal, the No 2 Songhua River, the northern waters of Nanhuanghai, Bohai Bay, and the Pearl River Delta. These works carried out a general analysis of pollution sources, major pollutants, and the extent and degree of pollution, together with related geographical environmental conditions. Beneficial experiences abroad were carefully studied, and some of the important academic concepts related to the evaluation of environmental quality were made clear: for example, environmental quality index, environmental quality change analysis, and environmental capacity. The environmental quality evaluation diagrams of cities and rivers were constructed, and some simple pollution models were formulated. These works provided basic data and diagrams for the improvement and protection of these regions and bodies of water and further supplied guidelines for the general treatment of the regional environment.

In the field of pollution ecology and environmental toxicology, some definite results have been achieved from research works related to farmland ecology; aquatic life ecology; accumulation of pollutants inside living bodies; migration, metabolism, and decomposition of heavy metals such as mercury, cadmium, lead and zinc; and pesticides; as well as from the study and observation of living things. As a result of a study related to purification of organic pesticide wastewater by means of oxidation of pond water, the individual action of the algae-bacteria coexisting system has been made clear; the same method was used to solve a problem related to the treatment of pesticide wastewater of Yaer Lake. Plants which are resistant or sensitive to sulfur dioxide, hydrogen fluoride, and chlorine have been screened and a list compiled. The nation's first book illustrating with color prints the damage to plants due to pollutants will soon be published. Research work was carried out using large low-dwelling animals as living bodies to measure resistance to pollution and a biological evaluation was made on individuals as well as on a group. Progress has also been made in the study of spread of mercury and lead in soil and plants, accumulation of mercury in soil and its form, the law of decomposition of phenol and cyanide in water and soil, and pollution of the soil by cadmium and its prevention.

The treatment and general utilization of the "three wastes" constitute a direct and effective means of eliminating the sources of pollution. Various units have applied physio-chemical and biochemical means, utilizing

activated carbon, catalysts, membrane technology, and extraction separation techniques. They have developed various methods of treating nitrogen oxide, sulfur dioxide, dichloromethane, DDT wastewater, wastewater containing phenol from grain pesticides, propenenitrile qinglun [520A 4858] wastewater, wastewater from printing and dyeing plants, and wastewater from movie film processing plants. Some of these methods have already been adopted for an industrial application; some are in the process of being tested, and have yielded satisfactory results.

Treatment of DDT wastewater by means of catalytic reduction using bimetal has proved feasible after intermediate experiment. The wastewater thus treated was found to satisfy the national discharge standard. Recovery and utilization of low concentration sulfur dioxide constitute one of the technically difficult treatment problems tackled here as well as abroad. Sulfur dioxide can be turned into dilute sulfuric acid by means of catalytic oxidation using activated carbon. Definite success has been achieved from an intermediate experiment carried out in an electric plant. The carbon surface active agent containing fluorine that was prepared was found capable of suppressing issuance of chromium mist. It not only saved power but also eliminated environmental pollution and protected the peoples' health. Cadmium was recovered from wastewater containing cadmium by using powdered coal ash, and the cadmium concentration in wastewater was reduced from 10 milligram/liter to 0.01 milligram/liter, reaching the national discharge standard as well as advanced world standards.

Environmental analysis is a technology which plays the role of the eyes and ears of environmental protection and environmental research. The Chinese Academy of Sciences, in cooperation with scores of scientific research units, institutes of higher learning, and environmental protection units, has carried out a study to develop and standardize environmental pollution analysis. As a result, some 200 measurement methods under 49 items have been established, including mercury, cadmium, arsenic, chromium, phenol, cyanide, DDT, 666, organic phosphate pesticide, petroleum, 3,4-benzopyridine, methyl mercury, chemical oxygen consumption, and dissolved oxygen. These methods were well received by various units, and the document concerning environmental surveillance and analysis standards which is being compiled by the Environmental Affairs Group of the State Council will contain all these achievements.

In recent years, a number of instruments and items of equipment to be used especially for environmental surveillance and research have been successfully manufactured. Included in the list of instruments and items of equipment are instruments used on an automobile for atmospheric air surveillance and on a boat for water quality surveillance. These instruments include instruments for measuring sulfur dioxide, ozone, and total oxidizing agents; instruments for measuring cyanide, chromium, arsenic, mercury, total organic carbon, fluorine, and ammonium; and instruments for measuring dissolved oxygen and combined index. A 325-meter steel tower for atmospheric observation and its remote sensing temperature and humidity instruments

have begun operation, supplying atmospheric pollution data for the nation's capital. This is the tallest tower in Asia. Its construction has provided this nation with the basic experimental equipment to study its atmospheric pollution and the basic laws of atmospheric science.

In the field of study related to environmental pollution and human health, the causes of tumors and Keshan disease were investigated and a collection of national tumor diagrams has been compiled by a joint effort with the health department. Keshan disease is a local disease which occurs quite frequently in some regions of this country. It has been found that its occurrence has an apparent regularity in geographical distribution. By combining the characteristics of Keshan disease and the natural environmental factors such as geology, terrain, climate, living things, and soil, a natural environmental model diagram favorable to the occurrence of Keshan disease and the environmental quality model diagram of some local areas have been drawn and compiled. Some preventive measures have also been suggested. Through communicative disease investigation and tests on animals, an antiaging agent D, which is used in the production process in the rubber industry, has been identified as a powerful cancer-causing agent. Suggestions were also made concerning improvement of problems related to cancer caused by chromium, which is used in the fur industry.

In the field of study related to environmental noise and its control, an investigation into traffic noise was carried out in eight major cities, including Beijing and Tienjin. An environmental noise measurement standard and testing regulations have been set up, and research on the theory of small aperture jet noise has been carried out. Research into and construction of small aperture diffuser mufflers and porous ceramic mufflers have achieved international standards and have thus contributed significantly to the reduction of noise and to silencing.

In the past 2 years, application of basic theory to environmental research has made a good start. Some system comparisons and in-depth studies have been carried out by combining actual problems of environmental protection. Trichloroacetaldehyde once caused a severe reduction in wheat production in some local areas of this country. Through on-site investigation and experiments carried out with pot-grown plants and other experimental analyses, it was learned that trichloroacetaldehyde was converted to trichloroacetic acid by the action of bacteria in soil. The cause of the damage to wheat was made clear and preventive measures were formulated accordingly. The solution of this problem helped deepen the understanding of environmental chemistry as well. To understand the cause of damage wrought by sulfur dioxide on plants, an in-depth study was carried out. It was found that sulfur dioxide caused damage to plants by destroying the selective permeability of the cytoplasmic membranes, causing a loss of potassium ion and a loss of ionic equilibrium inside the cells, resulting in overoxidation of the lipid component of the membranes.

Environmental background values are indispensable for the evaluation of environmental quality, for forecasting pollution trends, and for establishing

environmental standards. Since 1977, systematic study of soil background values was carried out at Beijing, Nanjing, and Guangzhou city in Guangdong Province. At the same time, a study of background values in the samples taken from ice, snow, soil, and living matter in distant districts was carried out. As a result, valuable data concerning more than 20 elements have been compiled, filling a blank page in the national data book.

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ENVIRONMENT PROTECTION ENFORCEMENT TO AID ECONOMY

Management Through Economic Means

Beijing HUANJING BAOHU (ENVIRONMENTAL PROTECTION) in Chinese No 3, 1980
pp 7-8

[Article by Gao Zhe (7559 0772): "An Opinion Concerning Environmental Management By Economic Means"]

[Text] The environment and the economy are closely related in modern social life. We all know that production and circulation in society and the activities of other national economic departments are all carried out within a certain environment. At the same time, the growth of the national economy brings about a great variety of influences on the environment. Therefore, to understand and treat the relationship between the environment and the economy correctly is to facilitate the rapid growth of the national economy while, at the same time, solving environmental problems well.

1. Environmental problems and the national economy must be understood as an integral unit. National economic development is carried out within a certain definite environment. For example, when soil, water, and air are polluted, agricultural production will suffer a loss. Enrichment of a body of water with nutrients and other forms of water pollution can seriously endanger fishery production. Industrial exhaust gas can cause corrosion of equipment. Industrial waste water can affect the water used by the industry itself. A large amount of industrial waste material, if piled up untreated, can hinder the continuous operation of industrial production. A working environment with polluted air and a foul smell can affect not only the workers' health but also their productivity. Various diseases brought about by environmental pollution significantly increase the expenses of medical and health services and the cost of labor insurance and welfare. On the other hand, we must recognize the fact that the so-called industrial "three wastes" are nothing but an unutilized form of energy and material resources. That is why we say that the environment and the economy constitute an integral unit with an internal organic relationship. In our actual work we must include environmental problems as part of the general balance equation of

national economic growth. To do thus is to be objective and scientific. It is also the most fundamental and most important side of solving environmental problems.

2. Now then, how do we unite these two dissimilar concepts--the environment and the economy? How do we carry out a combined balance computation of the environment and the economy? We must first transform environmental problems into economic form (i.e., express them in terms of value and currency). Let us analyze and elucidate this point one step further with an example. If a certain paper mill consumes 5,000 tons of caustic soda a year at 40 yuan a ton, then the amount of annual expenditure for caustic soda will be 200,000 yuan. This constitutes production consumption. During the production process, soda-containing waste water is discharged without treatment and thus pollutes a nearby body of water. As a result of pollution due to the soda-containing waste water, agricultural production in the surrounding areas suffers a loss amounting to 200,000 jin of grain, valued at 20,000 yuan. At the same time, the fishing industry in the surrounding areas also suffers a loss in fish production amounting to 200,000 jin, valued at 10,000 yuan. A total of 30,000 yuan for the two items mentioned above. (Other losses such as drinking water for the residents and alkalination of the soil have not been calculated.) In fact, these are also a form of consumption. This form of consumption has resulted from environmental pollution caused by the industrial production and is therefore commonly called "environmental pollution consumption." Suppose now that a waste water treatment plant is built in order to solve the pollution problem caused by the caustic soda used in the paper mill. The annual operating cost of this equipment is 20,000 yuan, but the loss of 30,000 yuan due to reduced production of grain and fish as a result of pollution has now disappeared. The operating cost of the waste water treatment equipment of 20,000 yuan constitutes a special form of consumption--"environmental pollution consumption." We must point out, however, that "environmental pollution consumption" does not occur directly as part of the production process. It occurs under a definite process which is an extension of the production process (for example, the waste water must be discharged in order to be able to continue production; once discharged, it creates a pollution problem and, consequently, "environmental pollution consumption"). We derive a brand-new concept from the above discussion; namely, in addition to the production consumption incurred during the production process of any industrial production, there exists a special form of consumption incurred during the process which is an extension of the production process and is called "environmental pollution consumption." This type of consumption can be likewise expressed in terms of value or currency. The value of "environmental pollution consumption" should be indicated in terms of the economic loss that would be created by the pollution or the expenditure required to treat the pollution. This rule applies to all other activities as well as to industrial production. For example, a hospital charges a fee for the medical treatment it dispenses, and the

activities related to medical treatment involve consumption and expenditure. The waste water and waste matter containing viruses and germs created as a result of performing medical treatment, if discharged untreated, will cause the spreading of various diseases. The medical cost for the treatment of patients thus affected, the cost of nutrition required to restore the health of these patients, and the wages paid to these patients while they are absent from the labor force are all a form of "environmental pollution consumption." The work related to economic management and environmental management of this nation today have basically not yet charged economic responsibility for the "environmental pollution consumption" to the department or unit which is directly responsible for the consumption. They are still blaming one another or society. This is one of the important reasons why our environment continues to deteriorate and why we have been unsuccessful in solving the problems for so long.

3. Application of "environmental pollution consumption" in actual work: Firstly, the concept of "environmental pollution consumption" must be applied to the general computation and balance of environmental problems in the course of national economic development. At present, our economic plan does not truly include environmental problems in its computation and balance. Therefore, environmental problems have not yet formally entered into the track of our national economic plan. If we employ this "environmental pollution consumption" as an index and determine the "environmental pollution consumption" of various major pollutants through a large volume of economic and technological computation work and then sum up the "environmental pollution consumption" of various pollutants, we can determine the "environmental pollution consumption" (expressed in terms of value or currency) of society over a period of time (say, a year). At the same time, we will be able to get the total sum of expenditures required to solve the environmental pollution problems over the planned period.

Secondly, this will aid in the implementation of economic measures in environmental management. To be sure, it is necessary to implement administrative measures in environmental management. However, if we employ administrative measures and principles as the basic method of environmental management, the work related to environmental management will never be effective. For example, the principle adopted in recent years that the polluter treat its own pollution problem did achieve certain definite results, but the effect was not really impressive. The main reason for this was the lack of a clearly defined, specific economic management method. Based on the concept of "environmental pollution consumption," the principle ought to be: the creator of pollution consumption is responsible for economic compensation. In other words, "he who pollutes, treats." This nation has already published its Environmental Protection Laws (tentative), which prescribe fees charged for pollution. This regulation, theoretically speaking, charges the creator of

pollution with economic responsibility for compensating the environmental pollution consumption. At present, some of the municipalities have begun trial implementation of this regulation. It is expected that this regulation will have a significant effect on this nation's environmental management. In determining the standard fees to be charged, we must make them represent as closely as possible actual "environmental pollution consumption." Overcharges will add an unfair burden on the enterprise; undercharges will encourage paying a little fine without actually solving the problem. Neither of these will generate the incentive to carry out industrial management and environmental protection well. If the fees charged for the discharge of pollutants basically approximate the "environmental pollution consumption," the problems related to environmental expenditure by this country can be considered basically solved, and there will be no need for the government to appropriate any funds separately.

Thirdly, in the process of reviewing the merits of various economic and technical projects related to national economic expansion and regeneration, including new construction, remodeling, expansion, and reconstruction for the purpose of developing latent potential, the presence of this environmental factor index--"environmental pollution consumption"--expressed in terms of value or currency will make any decisions more rational. At present, when we discuss the merits of a project or plan, environmental factors are often neglected, so that a greater price has to be paid later, after the plant has actually started production. In making a decision concerning the product and selecting the technology and process to be employed, we must take environmental factors into consideration, computing and comparing the "environmental pollution consumption." This action will have a significant impact on development and general application, adoption of nontoxic or low-toxic new technology, adaptation of closed circuit zero-discharge system, and development of nonpolluting new products with low toxicity and low residue.

Fourthly, regarding price policy, price adjustments must be made according to the concept of "environmental pollution consumption." For those products which pollute the environment more heavily, we must take appropriate measures to lower their factory price. At the same time, the sale price must be raised by such means as charging an extra tax in order to discourage, by economic measures, the production and consumption of those toxic products.

Fifthly, "environmental pollution consumption" should also be taken into consideration during the process of research and decision making concerning environmental protection measures and programs. We must fully utilize nature's ability to clean itself. Whenever the use of industrial purification equipment becomes necessary, the secondary pollution created by such equipment must be taken into consideration, as well as its "environmental pollution consumption."

We believe objectively that "environmental pollution consumption" exists in every real-life activity and every activity having to do with national economic development. This is an undeniable fact of life. Therefore it is imperative that a scientific concept be formulated from theory and abstraction in order to guide environmental protection work, so that activities carried out blindly or onesidely will be kept to a minimum.

Legal Work

Beijing HUANJING BAOHU [ENVIRONMENTAL PROTECTION] in Chinese No 3, 1980 pp 9, 10, 11

[Article by Deng Jianxu [6772 1696 3563]: "How the Environment May Be Protected By Laws"]

[Text] 1. Serious Environmental Pollution Problem Has Fast Become the Subject of Economic and Legal Work.

Suzhou is a resort city with beautiful scenery and rivers crisscrossing the city and dense forests. It was once called a paradise on earth. However, this city with its beautiful scenery is today covered with smoke and dust and surrounded by dirty water, thanks to more than 140,000 tons of waste water and a large volume of exhaust gases discharged each day by the factories. Not only has the inner city been heavily polluted, but the pollution is spreading steadily outward, threatening the suburbs. The damage caused by the "three wastes" has created indignation among the masses. According to statistics, during the first nine months of 1979 more than 280 letters were written by the masses registering complaints with the environmental protection department, and there were 28 instances of disputes between the factories and the masses.

Problems created or brought about by environmental pollution have seriously affected order in work, production, society and life and further affected the security and unity of the society. Therefore, pollution is no longer an ordinary environmental problem but has become a public nuisance, a social problem and, worse, a social security problem. In the face of such a grave problem, we cannot help but call the attention of the comrades who are in charge of economic and legal affairs to keep a close watch and consider these matters seriously: How can the functions of an economic court be fully utilized in the domain of environmental protection? How can the masses' health be protected? And how can the socialist economy be protected in order to promote construction of the "four modernizations"?

2. Weak System of Justice and Lack of Legal Concepts Help Create Environmental Pollution Problem.

To be sure, environmental pollution has many causes, but one of the most important causes is the weak system of justice and the lack of legal

concepts among the masses as well as among enterprises. Although the principles and methods concerning environmental protection have been drafted by the national environmental protection conference held in 1973 under the auspices of the State Council, and "Regulations Concerning Environmental Protection and Improvement (draft)" was published thereafter, these regulations could not be implemented completely, thanks to the interference and destruction wrought by the "gang of four." Environmental protection work has been basically at a standstill. After the "gang of four" was smashed, the central government in 1978 published documents related to environmental work, and in September 1979, the executive committee of the National People's Congress published the "Environmental Protection Laws" (tentative). Since the system of justice in the field of environmental protection was unsound for such a long period of time, and since the Environmental Protection Laws were legislated so late, stronger measures could not have been employed to protect the environment before this. He who polluted the environment heavily and thus broke the law did not get the punishment he deserved, which led some management personnel as well as some workers to ignore environmental pollution. As a result, pollution problems became more and more critical with the growth of industry.

Environmental pollution is directly related to enterprise management. Disorder in enterprise management can also lead to environmental pollution. Disorder in an enterprise is closely related to an unsound system of justice within the same enterprise and to a lack of legal concepts concerning a system of justice. For a very long period of time, industrial enterprise management in this country has adopted mainly administrative measures, while economic and legal measures have never been fully utilized. Especially, while Lin Biao and the "gang of four" were rampant, laws were destroyed, the system of justice was trampled, anarchy was raging, enterprise management was in disarray, and combustion, explosions, casualties, and serious environmental pollution took place repeatedly without check. A grave incident that took place at the Suzhou People's Chemical Plant on 12 September 1979 involved the dumping of 28 tons of liquid sodium cyanide into the river. Although serious neglect of duty by operator Zhang Changlin, who disobeyed operational regulations, was the direct cause of the incident, the incident exposed the weaknesses of the enterprise management of the plant. It revealed many serious problems, including an unsound system, lax safety measures, inadequate assignment of the labor force, and insufficient education relating to production safety. More than 100 tons of highly toxic liquid sodium cyanide were kept in a storage tank in the open, its valve gate without lock and key, and without any safety equipment. The operation and management of such a large volume of a highly toxic substance were assigned to two workers who had never been trained or educated properly and who lacked the knowledge of management or of production safety. Moreover, one of the workers was on an extended sick leave, so actually there was only one person, Zhang Changlin, who tended the storage tank.

After the "gang of four" was smashed and the enterprises were reorganized, how could such a dangerous situation still exist? One of the reasons is that the enterprise was not managed by economic and legal measures. Incidents do not concern cadres, and workers' affairs are not regulated by economic and legal responsibilities. As a result, after the first incident of sodium cyanide being dumped into the river took place in 1973, the practice was not prevented from taking place again but was allowed to be repeated again and again--as many as five occasions.

An unsound system of justice within an enterprise is reflected in the lack of legal concepts in people's minds. Many people believe that "mistakes are not crimes, and thus you cannot be convicted because of them." Some cadres believe that if you are not avaricious and are not corrupt, a little disaster in production management should not be considered a serious mistake, much less a violation of the law. There are also people who consider serious environmental pollution as a matter of course. They say: "Man must eat, so he must defecate; how can the "three wastes" be treated"? Because of a lack of legal concepts, they cannot understand the importance of preventing the "three wastes," and much less what constitutes criminal activity.

3. How the Functions of an Economic Court May Be Fully Utilized in the Domain of Environmental Protection.

An unsound system of justice and the consequent lack of legal concepts constitute one of the important causes of environmental pollution. Therefore, we recommend objectively that the rule of law must be strengthened. Strong measures must be employed in order to protect the environment. To strengthen the rule of law, we must first strengthen legislation. Although the "Environmental Protection Laws" have been drafted and published in this country, these laws are basic laws of environmental protection. We must legislate some specific laws and regulations to enrich and improve the system. As for the weak state of the system of justice within enterprises, factory laws, corporation laws, labor laws, and contract laws must be drafted. After a sound system of justice is established, its implementation must be guaranteed in order to be able to enjoy its effect and power. In order to guarantee implementation of the system of justice, we must on the one hand strengthen propaganda concerning the system of justice, educating the masses to understand the law and to obey the law voluntarily, making the law the standard of their behavior. On the other hand, law-enforcing organizations must strictly implement the law, prosecuting whoever violates criminal laws and investigating the criminal responsibilities, as well as investigating the legal responsibilities of whoever violates other laws. The majority of contradictions and disputes concerning environmental pollution can be traced to the lack of legal concepts and to the lack of a sense of duty--in other words, due to the internal contradiction of the people. Therefore, strengthening propaganda and education of the masses concerning the

system of justice is of the utmost importance. Based on this idea, the economic court of the Middle People's Court in Suzhou has carried out the following work since the publication of the "Environmental Pollution Laws."

1. Sources of pollution have been investigated in order to have a grasp of the conditions and to identify the problems. Some carried out propaganda concerning the system of justice. Problems of a general nature were discussed in conferences organized by the Bureau of Environmental Protection, and 319 units which had pollution problems were invited to attend. Comrades from the economic court explained the "Environmental Protection Laws" by analyzing the cases and problems. Problems of a special nature were propagandized individually as the investigation progressed.

2. Implementation of the collection of fees and fines according to the "Environmental Protection Laws": Since September 1979, the municipal Bureau of Environmental Protection has been collecting fees from the 15 heavily polluting units for dumping pollutants, according to the "Environmental Protection Laws" and the related regulations published by the Suzhou Municipal Revolutionary Committee. Those units delinquent in paying the fines, after repeated demands by the Bureau of Environmental Protection, were brought before the people's court. In order to maintain the solemnity of the "Environmental Protection Laws" and to preserve the functions of the Bureau of Environmental Protection, the economic court carried out a careful investigation of the reasons for not paying the fines charged for dumping pollutants, explained the obligation and significance of the fines charged for dumping pollutants, and propagandized the "Environmental Protection Laws." The court once again verified the quantity of pollutants discharged, and it ordered these units to pay the fines according to the law. In order to insure collection of fines according to the "Environmental Protection Laws" and implementation of fines, an arrangement was made with the banks to deduct the sum from the offenders' accounts, based on the court ruling, if the offenders refused to comply even after the economic court's ruling.

3. Offender Zhang Changlin, who committed the criminal action and whose criminal responsibility must be investigated, was swiftly brought before the court, and he was sentenced to two years' imprisonment. Nearly 700 persons, including the environmental protection cadres of seven municipalities controlled by the province, and leaders in charge of production safety at various plants in Suzhou, were present to hear the sentencing. In order to achieve even greater propaganda effect, the court process was recorded on film and then shown to the entire populace. After the sentencing of Zhang Changlin, a great reaction was aroused among the masses. Some considered that the sentencing of Zhang Changlin by the people's court for his grave responsibility so soon after the publication of the "Environmental Protection Laws" was timely. By its action, the court has guaranteed implementation of the "Environmental Protection Laws," made clear the spirit that "laws must be obeyed, enforcement must

be strict, and offenders must be punished." Some believed that the system of justice was trampled on when Lin Biao and the "gang of four" ran rampant. Persons responsible for grave incidents did not receive the punishment they deserved, so that incidents involving grave responsibility were allowed to occur repeatedly. Now things are different. Anyone who deserves punishment receives it promptly. Now people's life and property and construction of the "four modernizations" have some guarantee. The consensus of opinion was that this was true, real-life education concerning the system of justice. Awareness of the system of justice has been raised, and prevention of environmental pollution has been promoted. After returning to their plants, some leading comrades attempted to modify technology and processes so as to improve methods and equipment, in order to reduce environmental pollution and to come as close to achieving the discharge standards as possible. Some leaders have strengthened their safety inspection work. Every morning before work begins, leaders personally inspect various parts of the factory. Many plants have strengthened their precautionary measures. Since the public prosecution of Zhang Changlin, the Suzhou Electroplating Plant has called three meetings of the special professional members engaged in waste water treatment and adopted many preventive measures.

Since last September when the "Environmental Protection Laws" were published, and as a result of strengthening of the rule of law, plus a large amount of work carried out by the Environmental Protection Department, Suzhou Municipality has been able to strengthen prevention of "three wastes" all over the municipality and to reduce pollution. The results of measurements have confirmed that the concentrations of phenol, cyanide, arsenic, chromium, and aniline in water are on the decline. Atmospheric pollution has also shown improvement, and poisonous gases are diminishing. The occurrence of incidents involving concealed and grave responsibilities has been less frequent, and disputes between the plants and the masses are now few and far between. There has only been one case of a dispute between a plant and the masses and one case of environmental pollution caused by an incident since August of last year.

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CSO: 5000

PLANS FOR ENVIRONMENTAL PROTECTION OF BEIJING DESCRIBED

Beijing HUANJING BAOHU [ENVIRONMENTAL PROTECTION] in Chinese No 3,
1980 pp 2-3

[Article: "Strengthening Resource Management In Order To Protect The Environment"]

[Text] The four suggestions concerning Beijing's [environmental protection] work guidelines handed down from the Central Secretariat included a requirement that steps be taken to make Beijing Municipality become a beautiful, clean, and first-class modern metropolis. For those who are engaged in environmental protection work in Beijing, this is a glorious yet very difficult task.

We all know that deterioration of the quality of the urban environment affects all phases of metropolitan construction. It affects the three systems--natural, technological and social. The environmental problems of an area are closely related to the metropolitan population, to economic development, and to utilization of resources. One of the most important problems concerns production expansion and environmental pollution. More than 3,000 industrial enterprises, large and small, have been established in the Beijing area, including such heavy polluters as petrochemical industries, steel, pesticide, coke chemical, dye stuffs, paper, and other chemical engineering enterprises. In addition, there are approximately 500 electroplating plants scattered all over the city. These industrial enterprises are potential polluters. The department in charge of planning and managing environmental protection must attach importance to this matter and try to solve the fundamental problems.

Pollution due to waste materials is a part of production. Take grain production, for example. During the decade of the 1950's, world food production doubled. During the same period of time, chemical fertilizer production increased 4-5 times that of grain production, and pesticide production increased nearly 10-fold. According to one foreign estimate, approximately several billion tons of natural matter are discharged into the environment each year as a result of the working of national economy; the end products that satisfy society's demands

constitute only 20-30 percent of the amount of raw materials used, and as low as 1-2 percent in certain instances, while discharging 99 percent into the environment as pollutants. On the other hand, pollutants are further created during the process of using the end products. According to a Japanese estimate, the average utilization rate for all types of resources is only about 60 percent, while 40 percent of all resources are discarded as waste matter. Take plastics, for example. The total national production of plastics in 1970 was 2.39 million tons. After use, 626,000 tons were burned, 644,000 tons were buried underground, and only 75,000 tons were recycled. This is exactly why, when the national production doubled, environmental pollution increased from 20- to 30-fold.

Loss of land is also very critical. An American estimate indicates that the loss of farmland as a result of urbanization is twice as rapid as population growth. According to a UN estimate, loss of land due to urban expansion during the 1975-2000 period could amount to 300 million hectares, or one-fourth of the world's total cultivated land area. If loss of cultivated land due to erosion of soil were to be included, and assuming that the world's total population were to reach 6.253 billion by the year 2000, then the cultivated land area per capita would shrink from 0.3 hectare to 0.15 hectare, a loss of 50 percent.

Experts belonging to the Roman Club in Italy once made a prediction concerning the expansion of human society. According to their prediction curve, the material standard of living of human society would reach its apex in the year 2000 if the human population were to continue to increase unchecked and if resources were to be wasted while the environment were to be polluted as it is today. After the year 2020, the standard of human life would begin to fall, and after the year 2100 the entire human society would begin to decline. According to another estimate, the water of all the world's rivers will be drawn dry by the year 2100 if we continue to use today's imperfect technology and consume water at a steadily increasing rate of 4-5 percent a year. By the year 2230, man will have exhausted all the world's water reservoirs. If human beings still cannot come to grips with the matter and use finite natural resources wisely and protect the environment, the result can only be tragic. This kind of analysis and prediction should serve, at least, as a warning.

Phosphorus deposits in the United States amount to approximately 2.1 billion tons. Seventy percent of them are used as fertilizer, while 7 percent are consumed as detergents. Unless it is recycled, according to one estimate, phosphorus will be exhausted by the year 2075. The unrecovered resource becomes a harmful substance when it is arbitrarily discharged into the environment. Such a malicious cycle will in the end hinder sustained economic growth. Therefore, in the United States, not only has a waste-free system of phosphorus production been developed, but recovery of phosphorus from urban waste water has also been aggressively pursued.

The threat of exhausted natural resources and environmental destruction, combined with a simplistic approach to the "artificial treatment" of waste matter, has convinced more and more people of the profound need for a waste-free production system and general technology for utilization of waste water.

Development of waste-free production technology was motivated in the past decade by considerations of economic profit as well as environmental effect.

After studying the status of its own water resources, the U.S. Water Resource Committee pointed out that the total amount of water required by the national production in 1975 was 212.4 billion tons. It is estimated that the demand will increase steadily and reach 521.9 billion tons by the year 2000, but that the amount of water actually available at that time will be only 31.76 billion tons. It is evident that 94 percent of all water used in production must come from internal recycling. Recycling water and utilizing waste heat not only will effectively prevent environmental pollution but also possess latent economic value.

Development of a waste-free industrial production system is being accelerated abroad. A newly built chemical engineering general enterprise is said to have netted as much as several million dollars in annual economic profit after the development of a waste-free production process. Scores of black metallurgical enterprise have also set up a waste-water-free system. Petrochemical enterprises have reduced their annual consumption from 9.6 tons per ton of petroleum products in 1958 to 0.12 ton today. Some nations are predicting that their petroleum-processing industries will carry out production without waste water after 1980.

Environmental protection in this country started out with the correct guideline of achieving general utilization and turning harm into profit under an overall plan and rational disposition. Under the direction of this guideline, some plants and mines have achieved considerable results from application of the principle of generalized utilization. For example, the Shanghai No 2 Steel Plant used to consume 120,000 tons of coal annually. After positive measures were taken to utilize waste heat, a quantity of waste heat equivalent to more than 50 tons of steam was recovered. Except for eight tons of steam utilized in the plant, the remainder was supplied to 25 other units to be used for purposes of livelihood and production. Thirty-one coal-burning boilers have since been shut down, with a saving of nearly 40,000 tons of coal annually. At the same time, the environment has been significantly improved. It is evident that there is a great potential strength in the utilization of this energy source. Shijingshan Steel Plant has also achieved some definite results in recovering water and saving energy. For example, by utilizing the hot water taken from the furnace slug-quenching pond for the purpose of heating buildings, more than 40 small boilers could be shut down, with a saving of more than 20,000 tons of coal a year. Some

of the electroplating plants in Beijing have developed a closed circuit water system. The resources thus recovered all over the city are valued as high as several million yuan. Magnificent results have been achieved both for the economy and for the environment.

However, developments in this country in this field are still quite slow. According to 1977 data, the total organic phosphorus fertilizer production of this country was 130,000 tons a year. The content of effective components amounted to approximately 70,000 tons. But consumption of raw materials by the chemical industry was as high as 170,000 tons a year. Therefore, 100,000 tons of raw materials became pollutants and entered the environment.

In 1978, the average energy consumption per ton of steel manufactured in this country was 1.416 tons of standard coal, while in Japan it was only 0.8 tons. With an annual steel production of 30 million tons, the total amount of energy wasted was equivalent to 18 million tons of standard coal. The environmental pollution created by burning the wasted coal was even more difficult to measure.

Problems related to major sources of industrial pollution in the Beijing area have not yet been solved. The waste of industrial raw materials is serious. A certain pesticide plant in Beijing consumed 500 kg of diphosphorus pentasulfide to produce 1 ton of Leguo in 1974; consumption reached 1,100 kg in 1976. One of the pesticide plants destroyed its water plant. The unused waste heat at Shougang alone amounts to 150,000 tons of standard coal each year. If this were utilized, several hundred small smokestacks could be torn down. Some factories waste 70-80 percent of the water they use. The water resource wasted becomes an added load to the waste water treatment system. Any industrial development must first of all grasp well plant management and general utilization of resources. Planning departments and design departments must within a given area systematically develop production management which crosses over various departments. Industrial pollution problems can be completely solved only when the "three wastes" are recovered and turned into useful resources, only when auxiliary purification equipment is incorporated into plants' basic production technology components.

Environmental problems are policy problems. In order to reduce costs and to get good results, thoroughly eliminate pollution, and promote economic development, we must perfect existing or build a new waste-free production technology step by step. This is no longer a mere theoretical concept but an urgent practical problem. Practice over the past decades has proven that treating a pollution problem with the most advanced technology after it has become an established fact is at best poor management. The problem must be solved at its root by examining and evaluating production technology and resource utilization.

The important steps that must be taken in order to solve the industrial pollution problem of Beijing metropolis include the following:

1. According to the principles established by the concerned metropolitan department, the polluting industries in densely populated areas, especially those industries which pollute the air and those industries situated in the inner city that are considered to be serious polluters and whose problems are difficult to solve, must either change production, merge, relocate, or stop production.
2. Those industries which are retained must, first of all, strengthen their management and reduce leakage and emissions in order to cut down the amount of pollutants.
3. A definite amount of effort must be concentrated on technological renovation of key industries and for the development of waste-free production technology systems.
4. Newly built industries must carry out an environmental impact study and evaluation, or their building license should be withheld.

Practice here as well as abroad has proven that in the process of economic development, unless overall measures are adopted, the growth rate of environmental pollution usually far exceeds the rate of economic growth. This is a contradiction between nature and society. To be able to solve this complex contradiction, nature and the social economic process must be fundamentally combined into a united system, namely, an ecological economic system. The purpose of such a combination is to expand the ultimate product. We must deliberately steer and continuously guide our national economy toward a production technology system which consumes little and does not pollute the environment. This will not only satisfy the demands of environmental protection by not polluting it but will also satisfy the demands of continued national economic growth by preserving precious natural resources. This is an urgent duty and obligation facing human beings today. During the process of the four modernizations, we must take this problem as one of the important strategic tasks concerning our national economic growth, and we must conscientiously make plans and carry out research.

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CSO: 5000

MINISTRY URGES CONSERVATION OF REEFS, MANGROVES

Manila PHILIPPINES DAILY EXPRESS in English 15 Oct 80 p 12

[Article by Leonardo V. Micua]

[Text]

BAGUIO CITY - Depletion of the country's fishery resources has been blamed partly to the diminishing mangrove areas and coral reefs which are highly considered as natural eco-systems in marine waters.

This was revealed in a paper read by Assistant Natural Resources Minister Arnold B. Caoili during a recent meeting of experts to review the draft action plan for East Asian Seas.

Caoili cited the importance of mangrove areas and coral reefs which, he said, are nutrient sources, breeding ground and nursery areas for many coastal fishes and invertebrates.

No wonder, the loss of these natural fish habitats has something to do with the decrease of the volume of fish catch in Philippine waters -

one-time richest fishing ground of the world.

STATISTICS showed that at the end of 1976, the Philippines still had about 106,133 hectares of mangrove forests. Of the entire area, 91 percent fell under the category of public forest, while the rest were classified as alienable and disposable.

On the other hand, the Philippine coral reef cover is estimated at about 44,096 square kilometers at 40 fathoms and 1,200 to 1,300 square kilometers at 20 fathoms.

As to mangrove areas, often called swamps or "wastelands," their existence has been continuously threatened by harmful human activities such as dredging operations, filling, oil spilling, dumping of mine tailings, land reclamation, waste

disposal and their conversion into either fishponds or saltbeds.

Caoili pointed out that mangrove areas serve as nursery and spawning grounds for a variety of aquatic and terrestrial organisms. Many coastal and marine species use these areas as a source of food and shelter during part or all of their life cycles.

...

AS NATURAL eco-systems, mangroves also help stabilize coastal zones by reducing wind damage during typhoon and storm, by checking soil erosion and by building uplands through slow long-term sedimentation.

It was pointed out that from 1967 to 1976, a total of 342,167 hectares of Philippine mangrove forest were denuded - indicating annual average losses of

more than 34,000 hectares.

Of the total area deforested during this span of time, about 90 percent were converted into fishponds. The rest has been presumably used for saltbeds, urban settlements, mineral and agriculture.

Two programs are now being undertaken by the government to save the mangrove areas from total destruction. These are the Natural Research Program (NRP) which intends to provide research-based information to end-users of mangrove, and the Mangrove Research Development Program (MRDP).

Similar researches on coral reefs are being undertaken by the UP Marine Science Center, Bureau of Fisheries and Aquatic Resources (BFAR) and other responsible government agencies.

CSO: 5000

POLLUTION THREATENS FOUR MAJOR LUZON RIVERS

Manila PHILIPPINES DAILY EXPRESS in English Oct 80 p 2

[Article by Abe P. Belena]

[Text]

FOUR MAJOR rivers in the Ilocos region in Northern Luzon are heavily polluted, a price close to 500,000 farming families have to pay for progress.

Aquatic life has all but disappeared in Agno river flowing down from Benguet to the Pangasinan plain, the Bued river cascading down Kennon Road to the border towns of La Union and Pangasinan and the Amburayan river running down the border towns of La Union and Ilocos Sur. And only this year, the Abra river is getting contaminated by a pulp processing plant.

Not only the fishes suffered. Studies after studies made by various government entities on the extent of damages caused by pollution showed wide and lasting destruction.

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THE BUREAU of Soils regional office found proofs that mine wastes thrown into these rivers have cementing action on irrigated ricelands, choking the rice paddies. Non-organic sand disposed by the mines, unlike eroded top soil, renders ricefields infertile, soils officials say.

An ad hoc committee on pollution created by the Provincial Regional Officer for Development (PROD) as far back as five years ago, found out that 75,000 hectares of farm lands in Pangasinan and La

Union are directly hit yearly by physical pollutants from the mines in Benguet. In all, 19 towns in these two provinces receive fine sand, cyanide and mercury from the mines every year.

The impact on rice harvests, according to officials, is from 5 to 40 percent dive in yearly production of rice, depending on how close the rice plot is to the irrigation canal or the river. The closer it is to the water source, the more is the destruction and loss in produce.

THE PROD committee estimates that yearly damages in La Union and Pangasinan alone total P88 million. The extent of damages in Benguet, Abra and Ilocos Sur has not been studied.

In 1977, 12 mining companies in Benguet were milling raw ore at the rate of 46,000 tons a day. This year, the Bureau of Mines estimate has gone down to 38,000 metric tons daily with only nine of the mines fully running.

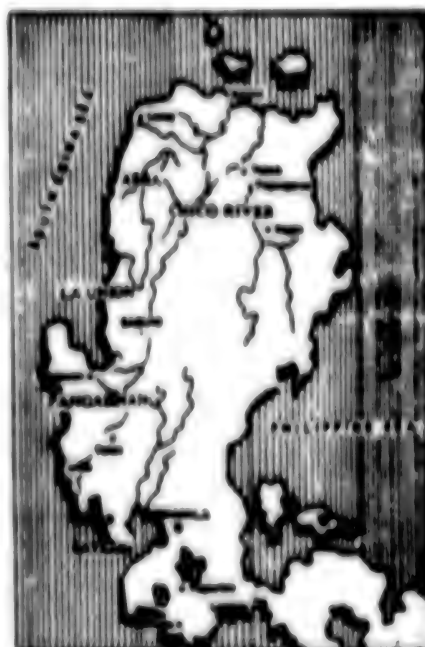
Only a small fraction of the pulverised rocks is extracted, 0.05 percent of gold and 0.5 percent of copper.

The rest are impounded in tailings ponds and rock dams. Part of these mine silt is carried downstream every day. The rest are flushed to the same rivers during heavy rains.

At their present production rates, the mines process some 12.96 million tons of mineral ore in one year, more than 99 percent of which turn to waste or silt.

But the mines are quick to deny any part in the pollution of the rivers. Most of them, with the exception of Black Mountain and Benguet Exploration, point at their "permanent" pollution control dams.

Bureau of Mines Regional Director Benjamin Obra, however, observed: "When you see white glowing sand at the banks of a river after a flash flood, you'll know that the mines opened the flood-gates of their dams during the flood. They usually do this to extend the life span of their impounding ponds and prevent the collapse of their dams."



A lot of proposals have been advanced to solve the problem. In 1978, the Japanese International Cooperative Agency (JICA) was commissioned by the government to make an extensive study and its recommendations.

The JICA supported an earlier plan to build a "common tunnel-laundry-pipeline system" from Benguet to the Lingayen Gulf in Pangasinan. The project would require a funding to the tune of P447 million. To make it self-paying, the mines will be asked to pay the government P2 pesos per ton of waste piped through the system.

Lately, this plan was scrapped in favor of the building of the San Roque multi-purpose dam in San Manuel, Pangasinan along the Agno river. The dam will cost almost the same as the pipeline, government engineers say. But it will have two other uses--as a source of irrigation water and electricity.

CSO: 5000

HEALTH MINISTRY URGED TO IMPROVE ACCRA ENVIRONMENT

Accra DAILY GRAPHIC in English 9 Oct 80 p 2

[Editorial: "What About Our Health?"]

[Text] **THE Minister of Works and Housing Colonel David Zanlerigu, says a €1.5 million crash programme to rehabilitate roads in Accra begins this week-end.**

This is good news. Motorists and pedestrians know too well the extent of damage our roads have caused to human beings and vehicles. Much has been said and written about the state of our roads and we shall leave that to the Works Minister to put things right.

We expect the Health Minister to come out immediately with a concrete and a more workable crash programme to rid our cities and towns — especially Accra — of accumulated refuse, baked excreta and stinking standing waters.

Besides food relief operations, no crash programme takes precedence over health — for a sound body needs a sound mind.

We cannot talk of increased productivity if the worker is sick from mosquito bites, or down with cholera, diarrhoea or dysentery.

Our surroundings are filthy. We live in stench. Yet we have, in abundance, well-trained medical and para-medical personnel. In addition, we boast of a whole institution — to protect our environment.

We continue to give our wards in schools lessons on hygiene and personal cleanliness. We are incapable of practising what we preach.

Currently, refuse trucks are carting rubbish, on a rotational basis, from the country's three cities. Does this arrangement really make sense? Who does this rotational arrangement benefit?

The trucks should be allocated to the three city councils on the basis of population and volume of refuse to cart so that each city or town could, at least, be kept presentable.

COUNCIL OF MINISTERS ANNOUNCES ANTIDROUGHT MEASURES

Maputo NOTÍCIAS in Portuguese 3 Sep 80 p 3

[Excerpts] The Council of Ministers of the People's Republic of Mozambique on 3 September issued a communique dealing with the serious situation in some regions of our country at this time due to lack of rain. Approximately 1.5 million people are most directly affected by the drought (in Maputo, Gaza, Inhambane, Sofala, Manica and Tete provinces).

Following is the [excerpted] text of this communique:

Introduction

The Council of Ministers has analyzed the serious situation in some regions of our country due to lack of rain during the agricultural seasons 1978/1979 and 1979/1980, which caused almost total loss of crops, shortage of natural grazing and difficulties in supplying water to the population. The council has made a general survey of the situation, its scope, its causes and consequences and proposed measures for fighting the effects of the drought.

It was noted that many of the measures proposed to fight the drought are the same ones that should be applied in fighting other natural disasters, namely floods and storms.

It is necessary to analyze the reason for the droughts and to face them, the direct consequences of the present drought, the measures to be taken to minimize its effects and also how to create conditions so that in the future we may be able to eliminate the consequences of droughts.

In spite of the fact that we are a country rich in surface waters, we are not benefiting from them very much, except from the rivers where dams already exist.

As a matter of fact, our surface water resources, associated to large expanses of good soil that we have, represent an enormous irrigation potential that could free our agriculture from the ravages of droughts.

In addition to surface waters we also have substantial reserves of underground waters.

Because of the scarcity of rain, lakes and small ponds have dried up and many wells have been depleted.

The deep wells that reach the deepest waters today are the only certain sources of water for supplying people and cattle.

We are again facing harsh reality: people who suffer, children who will forever be marked by starvation and illness, mothers who weep and children who die.

Characteristics of the Present Drought Situation

At the present time several countries in our region are suffering from the problem of drought: Somalia, Kenya, Ethiopia, Tanzania, South Africa, Zimbabwe, Zambia and Malawi.

In our country the present drought has similar characteristics to the ones that occurred in 1969/1970 and 1970/1971.

The regions suffering most are precisely those which, because of their natural conditions, normally have very little rain: the regions of the interior of Maputo, Gaza and Inhambane provinces and the southern and northern portions of Sofala and Manica provinces and south of Tete Province.

In Gaza Province, the regions of High Limpopo and High Changane, being the most arid in the country, have always been very much affected by scarcity of water.

Inhambane Province is an area always affected by droughts in all the districts of north and the interior: Govuro, Massinga and Vilanculos.

It is estimated that in the provinces most affected by the drought the number of people directly affected is about 1.5 million, distributed as follows:

Maputo Province. Moamba, Magude and Matutuine Districts--213,000 persons

Gaza Province. Chicualacuala, Massingir, Guija, Chibuto, Manjacaze, Limpopo, Bilene and Gaza Districts-- 385,000 persons.

Inhambane Province. Govuro, Massinga, Panda, Morrumbene, Vilanculos and Homoine Districts--300,000 persons.

Sofala Province. Chemba, Cara, Marroneu, Cheringoma, Buzi and Chibababa--290,000 persons.

Manica Province. Guro, Tambara, Barue and Mossurize Districts--93,000 persons.

Tete Province, Maturara, Changara, Magoe, Cahora-Bassa, Moalize, Chiufa and Zumbo Districts--360,000 persons.

In the affected areas various types of situations can be found: lack of water and food due to scarcity of rain, and loss of crops.

Lack of food due to loss of crops because of unseasonal rains.

In general, in the above-mentioned regions there were breakdowns in agricultural production of about 50 percent, which led to lack of food for the population and lack of marketable surpluses and seeds.

In some districts the people no longer have any money to buy the few products available in stores.

The sector most affected was that of family farms, because there were cases where planting did not even place due to lack of rain.

In some regions of Inhambane Province, the people planted but the crops died shortly after germination. In Sofala and Tete there were regions where the people planted three times, without success.

The livestock situation is critical in almost all the regions affected by the drought; the pastures dried and were burned in grass fires; there was lack of drinking water for cattle and antitick baths. As the result of all this, sickness and mortality among cattle have increased substantially.

Tens of thousands of heads of cattle are threatened.

The complete drying up of ponds, rivers and wells and breakdown of pumps in many deep wells also make critical the supply of water to the population of some affected areas, especially in Inhambane and Manica provinces, where the water table is about 100 meters deep.

People are forced to travel dozens of kilometers in search of water, wasting calories, making the situation of lack of food even worse.

Measures to Be Taken

In view of the seriousness of the situation in the regions most affected by the drought, it is urgent that some measures be taken aimed not only at minimizing the shortages of food and deficient health conditions of the affected people, but also and mainly to guarantee making it possible for these people to resume their normal productivity in the present agricultural season.

Therefore, the Council of Ministers prepared a program of tasks and a timetable for fighting the present drought, to be carried out by the central and provincial organs of the State Apparatus. This program includes the following:

Immediate dispatch to the affected provinces of high-energy content foodstuffs available in the country, by means of a readjustment of the Central State Plan.

Launching by the provincial governments of actions aimed at providing incentives for production in the areas of provinces, districts and localities where the problem of water is not pressing, so that in a short time to be able to obtain production that could help the affected areas.

To promote cattle fairs as a measure aimed at preventing the cattle from dying in the countryside.

Importation and urgent distribution of agricultural implements such as hoes, cutlasses, axes and scythes, and of very good and new pumps and motors for collecting water.

Active participation of the Mozambican People's National Liberation Forces in operations of support, mobilization and organization of the life of the people, in coordination with provincial governments, having as the base the rich experiences obtained by them during the armed struggle for national liberation and struggle against natural disasters.

Short-Term Measures

To improve awareness of the situation, planning and correct management of the existing means, and to give, progressively, to the provincial and district organizations the minimum technical ability needed to promote local solutions that would permit the utilization of the existing water and soil resources, and progressively to set up communal villages in the best areas we have available.

Rehabilitation of existing equipment and hydroagricultural infrastructures and systematic selection of places with the best conditions for agricultural production, as the way of stabilizing and consolidating community villages.

Selection and distribution of crops and seeds with greater resistance in order to introduce them into the areas that present the greater shortages of rainfall.

Construction of small water-control dams and more construction of drinking places for cattle.

Promotion of the utilization of equipment best adapted to specific conditions of every region in order to improve the supply and utilization of water (windmills, water mills, water wheels, hand pumps, and so on).

To reactivate the meteorological network at the local level and to alert various local organizations, especially administrations, to the importance of this activity, in order to improve quality control of workers of that sector, insuring the collection of meteorological data and their transmittal to the central organizations.

To develop the scientific study of the factors that influence the climate and especially those that influence agriculture, promoting the creation of an agro-meteorological section in the Meteorological Services.

Many of the solutions to the problems that we are facing are simple and within our reach. We do not have the means to drill new deep wells or build new dams everywhere at the same time. However, we shall easily be able to maintain hundreds of existing deep wells and small dams.

Observation of the actions we are to carry out in connection with the drought that is affecting us, also shows us that these actions are possible only because we have our people correctly organized and enlisted in the FRELIMO Party and because the capability of the state apparatus has increased.

We must get rid of the idea that the demographic structure and population distribution in the territory is immutable or impossible of change. Often the irrationality of the population distribution, which does not agree with the physical resources, is linked either to colonial oppression, which caused the flight of the population to inaccessible places, or the seizure of large plantations with the expulsion of Mozambican peasants who even then were working the most fertile lands, or to tribal tradition and other retrogressive customs.

Let us put into practice the immediate measures called for by the situation. Let us enlist all our actions of struggle against the present drought within the great political and organizational offensive now in progress, definitely breaking with the attitudes of passivity and immobility.

Urgent action is needed to drill wells and to rehabilitate manual and mechanical pumps.

Let us create new communal villages in correctly selected places, with guarantees of a production base and healthy living conditions for the people.

Let us be able to mobilize our entire people for their active participation in the struggle against the drought.

Let us make the fight against the drought an integral part of the struggle against underdevelopment.

The struggle continues!

The revolution will win!

Socialism will triumph!

Maputo 3 September 1980.

11635

CSO: 5000

INCREASINGLY SERIOUS PESTICIDE PERIL REPORTED

Salisbury THE HERALD in English 6 Oct 80 p 5

[Article by Phillipa Berlyn]

[Text] AT LAST the cocoon opened. I had been waiting patiently for half an hour or so, having persuaded myself that nothing I had to do was more important than to watch this small miracle of nature, and I am still sad when I remember it. For the butterfly that crept out to stretch its crumpled wings in the warm sunlight was horribly deformed, a butterfly that would never fly.

A quirk of nature? Or pesticides? And what, you may ask, does a deformed butterfly matter anyway? In isolation, of course, the butterfly means nothing. But the fact of the matter is that this small incident cannot be taken in isolation. A synopsis of incidents over the past five years makes this abundantly clear.

In October 1975, 20 wild duck were found poisoned in the Wedza area. Analysis of their stomach content showed monocrotophos as the poison.

Monocrotophos is used in quies control.

In September 1976, at Munemo Farm, Marandellas, grain poisoned by monocrotophos was found in the cattle paddocks. This poisoned bait had been laid by one of the labourers to kill guinea-fowl. The previous year two beasts which had

eaten similar poisoned bait had died.

In 1977 it was noted that the fish population in a farm dam died off almost entirely immediately after aerial spraying of a nearby crop.

In 1978 in the Gatooma area, the guinea-fowl and francolin population on one farm was wiped out as a result of the use of chemical cattle spray in which seed maize was soaked and used as bait.

In 1979, in Glendale, a farmer reported that as a result of the use of DDT on army worms on an adjacent farm, 64 Abdim storks had died.

In 1980, my deformed butterfly (and who knows how many thousands of birds and beasts) will have died as a result of the use of toxic pesticides.

The main offenders are DDT and the chemicals into which it breaks down — DDE — and the monocrotophos used for quies control; but a number of

other poisonous substances used for the control of problem animals—baboon, hyena, black-backed jackal, bushpig and monkey — have an equally disastrous effect.

In August 1977 amendments were set in train to make it illegal to use chemicals like monocrotophos for quies control but as yet insufficient action has been taken to control the use of DDT in areas where it is harmful to animals.

Yet DDT has been banned, for instance, in the United States since

1972. It has been restricted in parts of Europe since 1960, and is restricted in parts of South Africa, where it can be used only under special licence.

Why then is it that DDT and other toxic pesticides are in general use in Zimbabwe?

Protagonists of these pesticides — usually those involved in selling them — claim there is no proof of the harmful effects of DDT.

"No evidence," they say, when pressed about the effects of pesticidal chemicals and traces found in humans, in birds (especially raptors) and their eggs, and animals and fish.

There is evidence. In the eastern United States and eastern Canada south of the arboreal forest, there is one species of falcon, the *anatum peregrina*, that is now extinct.

There are similar statistics to back up this evidence. And sadly, in our own country, all the evidence collected points to the danger that many of the raptors will suffer either a decline in numbers or extinction within the next 15 years.

What will Kariba be, without the call of the fish eagle?

Sentiment aside, the presence of toxic substances in the food chain can only lead to the slow, creeping deaths of insects, birds, and, eventually, primates. The last, and most destructive of the primates, is man.

Meanwhile, despite the fact that the dangers of DDT-contamination are recognised in other parts of the world, its use in Africa, and in our country in particular, continues.

More than one-sixth of the Chimarira National Park is currently being sprayed to eliminate tsetse fly. About two-thirds of the Chirisa safari area in the Binga and Gokwe districts is also being sprayed. The spray used is DDT.

There is, as yet, no insecticide with the residual effects and the low costs of DDT, according to Mr Napier Bax of the Department of Tsetse Control. Endosulphan has less residuality and is much more expensive.

RESTRICTED

Research on alternatives such as the pyrethrins is continuing. An alternative method, which cuts out spraying and uses odour-baited traps, is being very

strongly pushed by the Tsetse Control Department, but this, too, is still in the early stages.

Therefore, although the use of DDT in our country is restricted to licensed users, Tsetse Control and the cotton industry and the public health campaign to eliminate mosquitoes — its use is still frighteningly widespread.

And while users of DDT sprays must be licensed, there is no restriction on the use of insecticides for gardeners in the urban areas.

Is that why my butterfly was so deformed? Is that why the bird population in our garden is so sadly reduced?

MARAUDERS

At the same time, one cannot help but have sympathy for the farmer and his need to protect his crops, bearing in mind, for example, the fact that one small quela eats double its weight in grain every day.

It is surely practical to use mist nets to trap these small marauders. It is also cheaper, and infinitely more humane than spraying death on the quela and leaving the dead bodies to be found by raptors and by scavengers who would in turn retain DDT in their systems.

There is no drama in the use of toxic pesticides (and therefore no public outcry) because the effects are gradual, and may be seen only when it is too late to do anything about them.

The drama lies in the fact that in setting up a chain reaction there is no one to say where it will stop. For all we know, we may be sitting back and monitoring the destruction of our ecosystem of tomorrow for the sake of today's profits.

WATER SUPPLY PROBLEMS BEING TACKLED--MSIKA

Salisbury THE HERALD in English 10 Oct 80 p 4

[Text]

THE provision of water supplies to villages in the tribal trust lands was being vigorously pursued, said the Minister of Natural Resources and Water Development, Senator Joseph Muka.

The urgent need for improved water supplies had been stressed by a number of Senators during committee consideration of his Ministry's vote as part of the Appropriation Bill giving effect to the Budget.

The Minister pointed out, however, that the provisions of major dams such as the Condo in the Saka Basin, which had been championed by Senator Ken Fleming, was not the responsibility of his Ministry alone.

Several other Ministries were involved, notably Finance and Agriculture, and there was bound to be some delay in making decisions.

Some dams had been built on the boundaries between commercial farming areas and tribal trust lands, but the water went only one way — to the commercial farmers. This disparity would be removed as soon as possible, he said.

All aspects of the Condo dam scheme were being thoroughly studied and according to present plans water should become available for the 1985 irrigation season. The building contractor should be able to start work within six months of the tender being advertised.

The Minister agreed that people had to be educated to practise soil conservation and avoid harmful practices such as cutting down trees. It was bad enough people cutting trees for fuel, but there were other "criminals" who cut trees for commercial purposes. "I want these people put out of business," he declared amid applause.

The Minister was applauded when he told the House that a far-reaching plan to spread a network of boreholes, pumps and pipes through remote tribal areas to pipe water right into villages was already in operation in one area.

Senator Muka explained that such a scheme would save women walking 5 or 6 km to fetch water in buckets from the nearest dam or river, and would allow them time for other work. He said water from boreholes would be pumped into tanks or reservoirs, and then piped to as many villages as the borehole had capacity to supply.

An extensive programme of repair to war-damaged or neglected boreholes had been launched, and the establishment of the piping systems would follow.

The benefits for the country would be great: "We cannot say we are developing when three-quarters of our population is drinking dirty water, water that is infected with germs."

The Minister told Senator Partridge that work was already underway on "outline development plans" for the country's major river systems. Preliminary reports by his Ministry had been completed.

He said publication of the reports had been delayed because of the necessity to revise data from earlier reports.

He hoped to widen the scope of underground water investigations so that within a few years much of the country would have been covered.

Senator Muka told Senator Partridge, who had asked about Zimbabwe's woodland, that the private sector had not committed itself to "any

economic forestry development.

However, the Government had embarked on a significant afforestation programme. About 800 ha of forest land were planned for the 1980/81 planting season — which figure will be increased to 1 500 ha in coming years.

The Minister said Zimbabwe had shown interest in starting its own kapenta industry on Lake Kariba, and officials had been to Zimbabwe to seek advice.

He said the impact on Zimbabwe's industry would be "nil" but assured Senator Partridge that a full agreement between the two countries would be enough to ensure there was no deterioration of the resource.

Responding to Senator Jack Mucsett's claim that water development by the Government had been largely aimed at the TTLs during the past 10 years, Senator Mafika repeated his allegation that development policies of past governments had been discriminatory.

He said blacks had been unable to raise loans for farm development or building dams, and some labourers had had to drink filthy water from reservoirs while white farmers enjoyed tapped water nearby.

There had been "racial discrimination" and "the colour we forget about it and look forward, the better", he told white Senators.

The Minister responded to Senator Partridge's call for a co-ordinating Ministry to unite the efforts of Ministries involved in development by saying there was already a Ministry of Economic Development which worked with the Treasury in establishing development guidelines.

He had "no intention" of suggesting to the Prime Minister, Mr Mugabe, that another co-ordinating Ministry be set up.

In the issue of water use raised by Senator Partridge, he pointed to the successes Israel had enjoyed in irrigating desert land, and said irrigation need not be confined to fertile soil.

He agreed that birth control was "a very sensitive issue", but stressed that a country's population could be expanded with its productive potential and pointed out that Zimbabwe was larger than many countries with far greater populations.

He said work was being done to educate Zimbabwe's people on birth control, but insisted it had to be done on a voluntary basis.

The uncontrolled cutting of trees on farms adjacent to the Fort Victoria road between Beaufort and Featherstone was condemned by Senator George Hartley.

Magnificent masau trees were being felled for the benefit of commercial wood vendors, with farmers in league with the wood cutters. "It appears there are no powers to control them," he said.

"There should be some authority in each district to exercise control over such people."

The Minister replied that his Ministry had learnt of this development and was most concerned. He had ordered an investigation, and he proposed to bring a Bill before Parliament that tree felling would be permitted only if the land was being cleared for agricultural use.

ALTERNATIVE

Replying to a plea by Senator Alex Ndirovu for the building of small dams at villages in south-west Matabeleland tribal trust lands for cattle drinking water, the Minister said all such schemes would have to be investigated first.

An alternative to small dams would be to pipe the water from the village supply to a point where the cattle could drink. The problem was being "taken care of", he said.

The Minister said that people in the TTLs could not be expected to pay for their water because they were too poor. The cost in the meantime would have to be met by the Government, but farmers would be encouraged to install small irrigation systems. When they were farming on an economic basis they would then pay for their water like everybody else.

Senator Mafika told Senator Ken Fleming that problems of ignoring basic conservation practices which he had reported were not confined to Matabeleland and the Marange TTL.

Senator Fleming said that he had heard Marange residents were recklessly ploughing up hillsides and cultivating streambanks, with the result that their area might be turned into desert within 10 years.

Senator Mafika said these problems had been fully considered in planning a new conservation strategy. When the new district councils were formed they would be able to tackle the problems in their areas with the full support of his Ministry.

The Prime Minister, Mr Robert Mugabe, would be taking part in National Tree Planting Day on December 6 to show the country that action was intended, not more paper-work.

The Minister told Senator Sam Whaley that he would try to make available to him the interim report of the committee examining the controversial project for a hydro-electricity project at Mpatia Gorge (which would flood the Mana Pools area).

The debate was adjourned until today.

POACHING IN UMFURUDZI DRIVES SPECIES TO BRINK OF EXTINCTION

Salisbury THE HERALD in English 10 Oct 80 p 1

[Text]

POACHING in the Umfurudzi safari area had been so severe that four species—corn antelope, waterbuck, impala and reedbuck—were "close to extinction" in the area, a wildlife official told the Bindura Magistrates' Court yesterday.

Mr Willem de Beer said this had emerged from a game count during a "mammoth" anti-poaching exercise involving the National Parks and Wildlife Management Department, the army and the air force.

Scores of wild animals, which would have been worth about \$50 000 in the State in compensation, had been killed by poachers, he said.

Mr de Beer was giving evidence in a number of trials in the Bindura Magistrates' Court dealing with offences under the Parks and Wildlife Act alleged to have taken place recently in the Umfurudzi safari area.

He said that during the exercise more than 1 500 snares had been removed from the area and the remains of 188 animals uncovered. He said that many of the snares were made of "heavy duty" cable

capable of snaring large animals, including hippos.

The anti-poaching teams had found a number of squatters in the safari area, he said. The squatters had set numerous snares and destroyed about 7 000 trees, including some fine, mature mahogany.

About 40 ha of land in the wildlife area had been cleared for cultivation, causing "irreversible scars" on the ecology of the area, Mr de Beer said.

Some parts of the Maros River running through the safari area had been virtually fished out, and he said 62 nets, of a total length of nearly 3 km, had been seized.

Mr de Beer added that although most of those appearing in court charged with offences under the Parks and Wildlife Act were peasants, the exercise had uncovered a "high degree of sophisticated poaching".

Almost 30 cases resulting from the exercise in the Umfurudzi area have appeared before magistrates Mr R. Harvey and Mr J. Haydock over the past three days. Police Sergeant B. Madore and Patrol Officer K. Oshtine prosecuted.

PLAN TO CURB DESTRUCTION OF WOODLAND

Salisbury THE HERALD in English 16 Oct 80 p 1

[Text]

THE Government had plans to combat the destruction of Zimbabwe's indigenous forest and woodland, delegates at the Energy Symposium were told in Salisbury yesterday.

A joint project, involving the Forestry Commission, Devag and the Whitson Foundation, was being planned to train foresters, establish nurseries, and educate the public through publicity, said the Minister of Natural Resources and Water Development, Senator Joseph Muka, in his opening address.

Research was continuing on the plantation of arid-zone trees and cassava was being grown in the Chesa Forest in Matabeleland as part of a project to see how ground crops fitted in with fast-growing trees.

The Minister stressed the importance of conser-

vation education and said that people had to become more aware of the need to conserve vital natural resources.

"It is our Government's aim to extend the conservation movement to the whole country with the setting up of conservation committees similar to those already operating in the present commercial farming areas," he said.

Liaison between the district councils and the Natural Resources Board would result in a better understanding of conservation in the tribal areas. In the urban areas, the Ministry hoped to persuade local authorities to establish fuelwood plantations.

The Government encouraged the development and promotion of low-cost stoves using electricity, coal or sawdust as a substitute for wood, as they relieved the pressure on urban woodland, said Senator Muka.

GREECE

ELEVSIS POLLUTION SOURCES REPORTED

Athens EXORMISI in Greek 20 Sep 80 pp 5, 6

(Text) Neglect, bitterness, and anger. These are the three elements which make up the deplorable state of affairs in Eleusis. And they will make up this reality for many years yet, as long as the industries and refineries continue to poison the residents with the wastes and the breeding grounds for germs which are being created every day from the exhaust gases of the various industries. The "Khalyvourgiki," the "Titan" and the "Khalyps" alone emit thick dust and poisonous gases 231 times a week. In more detail, the situation is as follows:

The "Khalyvourgiki" emits a total of 52,700 tons of dust and sulfur dioxide per year, which not only the workers but also the residents of the area have to breathe each day.

The "Titan" comes second, with an emission of 36,370 tons annually.

These are followed by the Aspropyrgos refineries, with 19,900 tons a year of the same "products," and lastly we mention the "Khalyps," with 9,270 tons.

This is a total of 110,000 tons of dust and sulfur dioxide per year which are suspended above the city of Eleusis. We have here, that is, total indifference to the biological condition of the residents.

These are the facts, which are confirmed by the "Dimokritos" atomic center, the Polytechnic, the Medical School of the University of Athens, and by other responsible sources.

And in order to give a more clear picture of the living conditions of the Eleusis residents, we should also mention the industrial effluents into the maritime gulf of Eleusis, which come to 411,000 tons a day.

Specifically, a relevant bulletin by the Municipality of Eleusis states that the "Khalyvourgiki" has a discharge of 380,000 tons daily of industrial wastes, mainly ammonia and toxic substances, the Aspropyrgos refineries have 24,000 tons, and the "Petrola" has 7,200 tons.

Also entering this gulf is a quantity of phenols (= poisons) on the order of 7,000 cubic meters a day, which is resulting in the total destruction of our maritime resources.

And as if all these nightmarish conditions which prevail here were not enough, we have to add further the 50-percent increase in the death-rate and the doubling of abnormal children born, which demonstrate the genetic consequences to the residents.

This was stressed in the appeal by the mayor of Elefsis to the international organizations to save Elefsis from industrial pollution.

According to conclusions reached in the doctoral dissertation of A. Polidorou, a percentage of 1.80 percent of all young persons here has been observed to have obstructive lung diseases, compared to the lowest observed percentage of 0.26 percent--something which constitutes an additional indication of the relation between diseases of the respiratory system and the pollution of the atmosphere.

At the Bodosaki enterprises in Elefsis, we met Petros Lazarou, a resident of Elefsis, who said to us:

"Life in Elefsis has been reduced to a low level, and this is due to two primary causes: The danger of poisoning to the residents, and the non-existence of any free time, inasmuch as the lower economic classes are compelled to work to the point of exhaustion, the result being that they do not participate actively in the public affairs of the city.

"The way we can avoid this pollution is to change the geographical location of Elefsis! But of course this is not feasible. In my opinion, the most feasible solution is the mobilization of the rank and file of the people along with their cultural and trade-union agencies, to make sure that when applied to this area, the government's policy on pollution is not totally unproductive, because in any case I personally believe absolutely that this issue is not a political or factional one, but a human issue.

"The final upshot is that we have nothing left but to take this matter into our own hands, despite all the difficulties which exist and which continue to increase because of the indulgence of the Right. The ultimate conclusion is that only our struggle to improve the situation will bring the desired outcome, since the present government is completely indifferent to the question of whether or not the Elefsis residents are dying day by day."

These are words filled with bitterness and disillusion. Daily, appeals are made by the municipality not only to the government but also to public organizations and to international health organizations. The result remains the same. Indifference and neglect.

In what follows we cite data given by the mayor of Elefsis from a report which he delivered at the town hall:

"Elefsis is and will continue to be the dirtiest city in Greece, as long as the shipyards and refineries continue to exist here. According to data from reliable sources, the more than 800 industries and small manufacturing outfits here--in which about 40,000 workers are employed--occupy an area five times larger than that occupied by the homes in Elefsis, while the area of the greenery is 14.5 times smaller than the international standards."

The concentration of the dust in the atmosphere has reached 1,233 micrograms per cubic meter according to measurements by the Ministry of Social Services, and this causes many respiratory ailments among children and workers in our city.

The Aspropyrgos refineries are discharging 24,000 tons of liquid wastes every 24-hour period, and about 20,000 tons are discharged by the "Petrola" company in the same period of time. If we add to this the sewage from Keratsinion, some 20 percent of which is carried by the streams to the Gulf of Elefsis, and from the hundreds of moored ships, no one will be astonished at the sight of this sea, which continues to be called a maritime gulf only as a euphemism.

Another cause of the ruining of the sea and the deterioration of the natural environment is the rubble fills, about 6,000 stremmas in area, by the Khalyvourgiki, the Niarkhos and Andreadis shipyards, the Petrola company, and other industries in this region. In general, the total pollution load on the sea around Elefsis has doubled in the last 5 years.

Along with this it should be stressed that permission has been given to the Niarkhos company to fill with rubble hundreds of stremmas of sea area around its shipyards.

Recently, permission was given to the Aspropyrgos refineries for expansion projects valued at hundreds of millions of drachmas.

Finally, in the report of the mayor it is stressed that it should be brought to the public's awareness that the dangers from polluting the environment in the Elefsis area do not concern only the Thriasian Plain, but also the entire region of Athens-Piraeus.

Finally, we will briefly cite the demands of the Municipal Council:

The establishment or even the expansion of any industry should not be permitted.

Standards should be legislated similar to those which are in force in foreign countries.

The quarries and the complex of tanneries should not be moved to the area of the Thriasian Plain.

The moored ships should be moved.

Special measures should be taken to protect the archeological area.

For all these things to be done, concern and a substantive effort are needed. Because, just as we have said before, it is very possible--more or less certain--that otherwise many "Elevsises" will develop. When will the responsible government figures at last become concerned?

12114

CSO: 5000

GREECE

NEW PARK AREAS PLANNED IN ATHENS VICINITY

Athens I VRADYNI in Greek 17 Sep 80 p 3

[Text] The Ministry of Regional Affairs will create the first unified urban park in Athens which will be 11 times larger than the National Gardens, approximately 2,000 stremmas, in the area of Tourkovounia-Omorfo-klesia.

This model park which will be used exclusively for recreational, athletic and training purposes will include, among other things, an open olympic-sized swimming pool, a model solar and wind-power station of both an educational and practical nature, a small-scale zoological garden with domesticated animals, a botanical garden, cycle-racing track, open air theater, cultural center, areas for exhibitions and picnicing, refreshment bars, walkways, children's equipment and especially plentiful and dense greenery.

Plytas: Suffocating Athens

The related preliminary study of the project which was composed by a task force from the Ministry of Regional Affairs was presented by the researchers on 16 September to representatives of local self-government and the Technical Chamber of Greece. Prefacing this presentation, the minister of regional affairs, G. Plytas, first referred to the absolute need for maximum development of the few possibilities of creating green areas in Athens in order to be able to breathe away from the suffocating construction and population and traffic congestion. He then stressed that, at any price, the following must be preserved as greenspace: the mountains of Attiki, Mount Ymittos, Mount Pendeli, Mount Parnitha, and Mount Aigaleos; the hills of Lekanopedion, particularly Tourkovounia; the streams in Lekanopedion; and areas of military installations which are being removed.

Next, the researchers cited data which verify this need to create green lungs in the capital, stressing that: Forty percent of Greece's population is concentrated in one city of a legislated area of 30,000 hectares. In the Athens urban complex, there are 2.62 square meters of green earth per inhabitant, while in European cities the proportion is 10 to 15

square meters per inhabitant and the goal is to reach 25 square meters per inhabitant.

The Omorfoklisia-Tourkovounia area, where there will be planting on 1,800 of its 2,000 stremmas, is composed chiefly of the Veikos Grove, the former Levendakis quarries and the Viarsopoulos Quarry. The reasons supporting their conversion into a park were summarized as follows by the researchers: Its acreage can absorb the recreational needs of the inhabitants of the whole area including the dense urban zone but also the wider area of the capital. Its position is in the center of the Athens complex which facilitates swift escape to it from any point. From the standpoint of construction, it is the only free piece of land remaining.

However, one serious impediment to adoption of the park is the fact that the land in this area of Tourkovounia belongs to small and large owners as well as to owners of arbitrary buildings (50 to 60). As a result, in order for the public to acquire this land, three to four billion drachmas are needed for expropriations, according to March 1980 estimates.

Since this amount is judged prohibitory, the researchers propose that for the land to be obtained and the owners not be wronged, the applicable law (Law 880/79) be applied broadly, so that the owners can acquire lots in other areas of Athens. It is suggested that this measure be combined with expropriations to a small extent.

No One Is Going To Be Wronged

Even though no definite decision has been made about the way of obtaining the land in Tourkovounia, many owners of the area who were present at yesterday's demonstration expressed their uneasiness about the settlement of their properties because, as they maintain, the preliminary study of the project includes many ambiguities. The same fears were stated by the mayors present, who stressed that a social problem must not be created by the adoption of the plan, given that 71 families live in legal and arbitrary buildings in the area.

Answering these reservations, Plytas--who listened to the entire four-hour presentation--stressed that the government's intention is to deal with the matter so that the small owners especially will be satisfied as much as possible. Moreover, he noted that all the things heard are included in a preliminary study and are simply proposals of the researchers and that the final decisions will be made in cooperation with local self-government so that no one will be wronged.

Plytas ended by saying that despite the above difficulties, this area must become and will become, in any case, a green lung.

A conference is being held today at the Ministry of Regional Affairs, during which Plytas will discuss with representatives from the Public Land Company the issue of the Tourkovounia properties and the way to settle it.

RADIOACTIVE ENVIRONMENTAL CONTAMINATION TECHNICAL REPORTS

Rome NOTIZIARIO COMITATO NAZIONALE PER L'ENERGIA NUCLEARE in Italian Jun 80
p. 68-72

[Bibliographic listing with abstracts of technical studies made available by the (Italian) National Nuclear Energy Commission (CNEN)]

[Text] Safety and Protection

CNEN - RT/PROT(79)5

P. Balloni, G.F. Clemente, S. Di Pietro, S. Quaggia (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Preliminary Data on the Study of Transfer of Low Levels of Tritium from the Environment to Man"

Summary - The tritium intake through dietary ingestion and inhalation has been determined in seven healthy subjects selected as a group of unexposed people representative of the general Italian population. The fecal and urinary tritium excretion have been also measured in the same subject together with their blood tritium concentration. In all samples the «loose» water tritium and «organically bound» tritium have been measured. The mean value \pm S.E. for the tritium dietary intake is 974 ± 250 pCi/day for the «bound» fraction and 309 ± 80 pCi/day for the «loose» fraction. The tritium is excreted for more than 90% in urine and the mean value \pm S.E. for the tritium urinary excretion is 1030 ± 310 pCi/day. An approximate equilibrium condition has been found for the metabolic balance between the daily tritium intake and excretion on the entire group of subjects. The mean value \pm S.E. for the total tritium concentration in blood is 8.3 ± 1.5 pCi/ml, the value of the «bound»/«loose» ratio in blood is 1.5. The mean value \pm of the blood/urine ratio for the «loose» tritium fraction is 0.3 ± 0.4 .

The diet «loose» tritium specific activity are similar to values for tap water, while the blood «loose» tritium specific activity are higher more than a factor 10 as compared to values for diets and tap water. The distribution of the data would indicate that the specific activity in the «loose» fraction in blood and urine of our subjects may be well greater than that in water under chronic environmental exposure, thus showing that tritium will concentrate in the human body above ambient levels.

CNEN - RT/PROT(79)6

G.F. Clemente, G. Santori, A. Renzetti (CNEN, Department of Radiation and Safety and Protection Research), A.K. Bachvarova (Institute for Roentgenology and Radiobiology, Sofia 56, Bulgaria)

"Evaluation of Exposure Due to ^{210}Pb - ^{210}Pb in the Italian Population"

Summary - Following an introduction on the behaviour in the environment and in man of ^{210}Pb , ^{210}Po , experimental data are reported on ^{210}Pb , ^{210}Po exposure of the Italian population.

The analytical methods used to measure ^{210}Pb , ^{210}Po activity in the many biological and environmental samples analyzed are also reported. The data collected refer to the intake, excretion, internal burden and metabolism both in a group of subjects representative of the general population and in other critical groups exposed to high internal contamination of ^{210}Pb , ^{210}Po , as the radioactive spa workers and the miners.

The absorbed dose due to ^{210}Pb , ^{210}Po has also been evaluated, on the basis of data referring to the various population groups.

CNEN - RT/PROT(79)7

E. Manilia (CNEN, Central Directorate for Nuclear Safety and Health Protection, Rome)

"EMUF--A Computation Program for Dealing with Transient-Temperature Conditions in a Solid with Surface-Phase Change"

Summary - The EMUF code deals with transient heat-conduction problems with free boundary conditions. Sublimation from a layer of solid UF₆ at constant heat flux is then reported as an example.

CNEN - RT/PROT(79)8

G. Cucchi (CNEN, Central Directorate for Operations, Bologna)

"Evaluation of Risks Connected with Installation of Fire Detectors with Americium-241"

Summary - Aim of the present report is to make an evaluation of the dangers entailed by the use of the detectors using Am-241 radioisotope sources. The author and other researches have made some dose rate and contamination measurements, the results have been elaborated to determine routine and accident dangers, with particular emphasis on the consequences of fire.

The author has then formulated some simple radioprotection norms.

CNEN - RT/PROT(79)9

P. Amadesi, G. Cucchi (CNEN, Computer Center, Bologna)

"Montecuccolino Nuclear Engineering Laboratory, Protection against Ionizing Radiation"

Summary - The new 76/179 Euratom norms have put emphasis on the need of more efficient and unified criteria for the classification of the controlled areas and of the workers exposed to ionizing radiation. This report expounds the criteria adopted by the authors in connection of the Italian and international norms. There have been drafted also radioprotection norms for workers exposed to radioactive contamination. At last there are reported the criteria adopted for individual and environmental monitoring.

CNEN - RT/PROT(79)10

G. Busuoli, A. Cavallini, O. Civolani, R. Nanni (CNEN, Department of Radiation and Safety and Protection Research, Bologna)

"The Dosimetric Service of the CNEN" (Offprint from NOTIZIARIO DEL CNEN, Year 24, No 11, November 1978, pp 31-38)

Summary - Since 1958 CNEN has been supplying dosimeters for X-rays, gamma radiations, slow neutrons and fast neutrons for the trunk and for environmental-dose measurements. For the limbs, ring and bracelet dosimeters are available for X and gamma radiations. The users are about 300 organizations throughout Italy, for a total of about 12,000 dosimeters in the period considered. The article describes the dosimeters supplied and the methods used to obtain the dose value.

CNEN - RT/PROT(79)11

V. Ferrara (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Getting Rid of Residual Heat by Means of Evaporation-Type Cooling Towers: Possible Climatic Effects in General, and in the Case of Piemonte in Particular"

Summary - A general critical analysis about the possible environmental consequences produced by large evaporative cooling towers is carried out. Then, dealing with a particular case, such as the climatological characteristics of western Po Valley in the neighbourhood of Monferrato Hills, an evaluation about the probable effects on local climate resulting from hypothetical thermal discharges in the atmosphere, is shown.

CNEN - RT/PROT(79)12

A. Donato (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Study of the Characteristics of the Ureaformaldehyde Resins Incorporating Spent Exchanger Resins Generated in Nuclear Power Plants" (Offprint from ATOMKERNENERGIE/KERNTCHNIK, Vol 33, 1979, pp 34-37)

Summary - The properties of urea-formaldehyde incorporating spent Powdex ion exchange resins were examined from the radiological protection and safety point of view. The following properties were taken into consideration: flammability and heat resistance, mechanical strength, resistance to weathering, leachability. Urea-formaldehyde presents very poor mechanical resistance, extremely high leakage of Cesium, very low pH values produced in the water going in contact with it, no resistance to weather cycles. It is opinion of the author that urea-formaldehyde cannot replace cement or bitumen for the solidification of spent ion exchange resins from nuclear power plants.

CNEN - RT/PROT(79)13

I. Benfenati (CNEN, Fast-Reactors Department, Bologna)

"Preliminary Study on the Atmospheric Diffusion of the PEC Reactor Chimney"

Summary - Starting from the project characteristics of the PEC chimney and air-unit-heaters, as proposed by NIRA, calculations have been made of the yearly maximum and mean values of the ground level concentrations of the Kr and Xe radioisotopes discharged from the chimney in the atmosphere under normal operating conditions. Comparing the obtained results with the maximum allowable concentrations in the air, of these radioisotopes, a safety margin of the order of 10^3 - 10^4 has been put in evidence, which is interesting and favorable in case of accident (under evaluation). Taking into consideration the influence of the air-unit-heaters on the atmospheric diffusion of the chimney discharge, we can deduce that the safety margin will further increase, as compared with the computed value under unperturbed conditions. A preliminary evaluation of the heat diffusion of the air-unit-heaters in the atmosphere, for a heat discharge of 130 Mw equal to 3.12×10^8 Kcal/sec, gets rid of the preoccupation on any possible modification of the local climate.

CNEN - RT/PROT(79)14

A. Brondi (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Studies of the Important Geological Factors for Determination of Environmental Contamination of the National Territory" - Part 1

Summary - Unavailability of significant basic data may raise difficulties in environmental pollution studies. Besides data seem to be sometimes arbitrarily explained; in fact unconscious conceptual misunderstanding may occur consequent to lack of confidence with the problem being dealt with. The present review is aimed to provide the material needed to improve the guidelines for environmental studies and management, as well as to provide a comprehensive collection of basic environmental data for the Italian country. Guidelines are developed in the preliminary remarks and in an introductory report dealing with examples related to the utilization of the Mediterranean sea environmental data, in order to define a systematic approach to pollution of the environment.

B. Anselmi, F. Benvegnu, A. Brondi, O. Ferretti (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Studies of the Important Geological Factors for Determination of Environmental Contamination of the National Territory" - Part 2

Summary - Direct survey data related with the granulometric and mineralogical characteristics of the Italian alluvial sediments are compared with the lithology of emerged basins in order to analyze the influence of the geological formations on the nature of marine sediments.

A preliminary identification of the most widespread morphotypes characterizing the Italian coast has been carried out on the basis of the available cartographic and geological data. For each one are furnished the distinctive character, the geographic distribution and the potential degree of contamination.

Examples of correlation, between emerged and submarine basins, either from a geochemical and sedimentological point of view, are also given.

CNEN - RT/PROT(79)15

G.C. Cortellesa, A. Marchetti, A. Susanna (CNEN, Directorate of Nuclear Safety and Health Protection, Rome), A. Divina (CNEN, Department of Radiation and Safety and Protection Research, Rome)

"Considerations on Radiation Protection in the Use of Color Television Sets" (Offprint from L'ELETTROTECNICA, Vol LXVI, No 5, 1979, pp 361-371)

Summary - The paper presents the results both of measurements of low energy X-ray radiations emitted by color-TV sets and of dosimetric surveys in industries manufacturing or importing color TV kinescopes. Besides laboratory measurements are reported, which were carried out on fragments of the screen and the kinescope glass envelope in order to establish the radiation absorption characteristics of the material making up the kinescope.

The data obtained are wholly reassuring. The measures on color TV sets were actually below regulatory limits. The radiation risks encountered in factories manufacturing color TV kinescopes are very limited even though they cannot be totally disregarded. Moreover they can be kept under control by the adoption of appropriate radiation protection procedures as it the case with every practice correctly employing radiation emitting devices. Such results agree besides with the laboratory measurements reported in the paper.

CNEN - RT/PROT(79)16

S. Finemattai, M. Roberti (CNEN, Central Directorate of Nuclear Safety and Health Protection, Rome), M. Moscati, G. Scarpa (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Air Transport of Radioactive Materials--First Evaluations of Dose Absorbed by Passengers and Crew"

Summary - In order to evaluate radiation exposures to passengers and crew members in passenger aircraft carrying packages containing radioactive materials measurements were made of radiation dose on passenger seats and on the pilot cabins by means of TL dosimeters.

The experimental method used and the analysis of data are described in details.

The results show that the radiation doses to passengers due to the transport of radioactive materials is in the worst case less than 1/3 of the background dose. The measured dose rate due to cosmic radiation is 0.2-0.3 mrad/h in good agreement with the data existing in the literature.

CNEN - RT/PROT(79)17

G. Beone, I. Di Stefano (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Enclosing of Silver-Coated Zeolites in Cement: Part 1 - Study of the Variables and First Results"

Summary - Spent silver-coated molecular sieves are a little fraction of wastes from nuclear reactors and fuel cycle plants, and more knowledge about their incorporation is wanted. The effects of silver-coated molecular sieves on the quality of cement incorporation products were studied. Product characterizations were based on properties relevant for safe waste management, storage, transport and disposal. The evaluation is experimentally carried out according to standard or generally accepted methods.

CNEN - RT/PROT(79)18

W. Bocca (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Characterization of Long-Lived Radioactive Wastes to Be Disposed in Geological Formations: Part 1 - Radiation, Thermal and Radiotoxicity Properties"

Summary - High level solid radioactive wastes, cladding hulls and alpha wastes from reprocessing and mixed oxides fuel fabrication have been considered as to be disposed of into geological formations. On the basis of some initial assumptions, concerning the nuclear fuel performance, the reprocessing time and the partitioning of radionuclides in the different wastes considered, the radioactivity, the thermal power and the radiotoxicity hazard have been calculated by making use of the well known ORIGEN Code. The results of the calculations are reported in form of tables or figures for the total wastes and for the most important radionuclides or radionuclide groups.

CNEN - RT/PROT(79)19

W. Bocella (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Characterization of Long-Lived Radioactive Wastes to Be Disposed in Geological Formations: Part II - Characteristics and Quantities of the Conditioned and Packaged Wastes"

Summary - High level radioactive wastes, cladding hulls, alpha wastes and waste from the spent fuel reprocessing and the mixed oxides fuel fabrication have been considered as to be disposed into geological formation. On the basis of some initial assumptions the chemical and physical characteristics of the conditioned and packaged wastes have been evaluated and reported. Starting from the chemical composition the chemical toxicity hazard measure of the conditioned and packaged wastes has been calculated and compared with the radiotoxic hazard measure by ingestion. Finally the number of packages, the volume and the weight of the conditioned and packaged long-lived radioactive wastes resulting from the nuclear fuel cycle activities concerned with a nuclear program of 6000 Mw_{th} have been estimated.

CNEN - RT/PROT(79)20

S. Tirini (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Methods of Discharge of Thermal Effluents from Nuclear Power Plants, with Special Reference to Diffusion by Means of Jets"

Summary - This paper deals with the problems related to thermal discharges from nuclear power plants. A rough evaluation of heat and water amounts discharged into the water body is presented, together with a discussion on various types of cooling systems, with a particular emphasis on the open cycle system. The analysis of such a system is carried on, considering firstly discharges by means of free water channel and secondly discharges by single and multipoint jets, both in deep and in shallow water. The main equations on fluid dynamics are reported in the appendices.

CNEN - RT/PROT(79)21

A. Delle Site, V. Marchionni (CNEN, Central Directorate for Operations, Casaccia), G. Santori (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"A Sensitive Method for Determination of Plutonium in Environmental Samples"

Summary - Development of a sensitive method for the determination of $^{239,240}\text{Pu}$ and ^{241}Pu in marine samples (sediments, water, and organisms); soil and human diet is described. After a suitable chemical pretreatment of the samples the plutonium is separated by extraction chromatography with tri-n-butylphosphine oxide (TOPO) supported on an inert porous polyethylene. A double extraction is necessary to achieve a sufficient decontamination from natural thorium and its decay products. After electrodeposition of plutonium from ammonium sulfate, the plutonium counting is carried out by a low background solid state detector (0.004 cpm/0.0003 α) in the range of the $^{239,240}\text{Pu}$ peak connected with an alpha spectrometric chain. The global yields of the method are: sediments 43.4%, soil 44.8%, sea water 62.6%, human diet 63.0%, marine organisms 81.7%. The reagent blank activity is such to allow the determination of some femto-curie per sample of $^{239,240}\text{Pu}$ and ^{241}Pu .

CNEN - RT/PROT(79)22

G.F. Clemente, A. Renzetti, C. Santori (CNEN, Department of Radiation and Safety and Protection Research, Casaccia)

"Determination and Significance of Skeletal Doses of ^{210}Po in Radioactive Spa." (Offprint from ENVIRONMENTAL RESEARCH, 18, 1979, pp 120-126)

Summary - The high exposure due to radon and daughter products found in many Italian radioactive spas, suggested a research program destined to assess the lung and skeletal doses accumulated by the subjects working in those spas. The assessment of such doses will permit the evaluation of the significance of a follow-up of the exposed subjects with epidemiological studies. In this paper some preliminary results will be discussed, mainly related to the estimation of the ^{210}Po skeletal doses in a few subjects. The ^{210}Po , ^{210}Pb skeletal burdens in the subjects have been evaluated on the basis of their ^{210}Po , ^{210}Pb urinary excretion collected at various intervals during a period of 1 year. The experimental results on the most exposed subjects have shown skeletal doses of the order of 20-40 rem/year and lung exposures higher than 100 WLM (Working Level Month).

CNEN - RT/PROT(79)23

D. Capecchi, R. Crostini, E. Panagia (CNEN, Central Directorate of Safety and Health Protection, Rome)

"Verification of Reinforced-Concrete Sections for Rupture from Axial Load or Skew Bending"

Summary - A method and a program to verify a section in reinforced concrete subjected to axial load and skew bending are presented. Italian ACI and CEB standards have been examined.

CNEN - RT/PROT(79)24

D. Capecchi, R. Crostini, E. Panagia (CNEN, Central Directorate for Nuclear Safety and Health Protection, Rome)

"Charts for Calculating Rupture of Rectangular Reinforced-Concrete Sections Subjected to Skew Bending and Axial Force"

Summary - This paper presents charts which can be used to determine the rupture of a rectangular section in reinforced concrete submitted to skew bending and axial force. Five types of reinforcement distribution and three types of steel have been considered.

CNEN - RT/PROT(79)25

D. Lattanzi, G. Neri, C. Papa, S. Paribelli (CNEN, Central Directorate of Nuclear Safety and Health Protection, Rome)

"Principles of Radiation Protection in Designing the Layout of Light-Water Nuclear Electric Power Plants"

*Summary . In this report the main principles of radioprotection are
drawn up in view of a sound design of LWR layout. Particular
note has been taken for what concerns the layout of buildings, working
areas and equipments allocations are reviewed and discussed in order
to reduce the doses absorbed by workers.*

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PROBLEMS OF POLLUTION OF BAY OF NAPLES DISCUSSED

Naples IL MATTINO in Italian 20, 21 Sep 80

[Article by Aldo Stefanile]

[20 Sep 80, pp 1, 2]

[Text] Naples--It will take 10 or maybe even 15 years for the Gulf of Naples purification system to be fully operative and for the water from Volturno to Picentino to become clean again and for the area's environmental degradation to stop. It is now 1980: it will be 1990 or--the pessimists say--1995 before we can breathe a sigh of relief. That is, provided no other problems arise in the next few years and solutions can be found to political, decisional, and planning problems that have so far stood in the way of some basic projects and are still weighing heavily on the Fund for the South's "Special Project 3."

This is a matter of fact confirmed by technicians and politicians, though with various shadings of outlook. While it is true that some projects are being carried out, and while it is true that the Acerra-Pomigliano purification plant has finally been started and the Cuma plant (the first of the projects that will constitute a functional complex) will be completed by the end of 1981 or in 1982, it is also true that other projects have been slowed down, and that while contracts have been let and financed (a hospital zone, Ischia, Foce Sarno), the work has not yet been started; nor have other contracts been let, as decisions have to be made that precede the operations phase. These are big projects, indispensable for the purification system that is the basis for the "water purification plan" that the region has been preparing.

Unfortunately, the present situation has been brought about by arguments between technicians and politicians, conflicts between various interest groups, laws (such as Nos 319 and 650) added to present ones, requiring new planning and updating, opposition by local governments and groups, and the "physiological" delays inherent in big projects. At a few points in the gulf, some slight signs of improvement have been noted; they are due to the underwater conduits, halting excessive discharges--124 cases reported by the city, the installation of safety valves in private plants, etc. But there is no cause

for complacency: water purification is a unitary process; it begins upstream, where urban and industrial effluent must be taken at its origin and channeled into the sea only after being treated. It takes a long time for this to happen.

The gulf is not made up of stagnant compartments isolated from each other. Water and sediments come into the zone from the Volturno river, and the waters of the Sarno bring to the sea elements found all along the Sorrentine coast, as far as the bay of Jeranto.

But the treatment system provided for by PS 3 [Special Project 3] still exists only on paper. It involves 190 communes in the provinces of Naples, Avellino, Benevento, Caserta, and Salerno; it involves water for private and industrial use; it is divided into 15 districts, treatment plants and conduit systems; it is the basic system of the regional water treatment plan decided upon by the Campania region and presently under study. But it is moving slowly. Delays are piling up. More are feared.

The available data about work in progress date from June 1980. They are thus sufficiently current because not much could have been done in two months, considering holidays and work stoppages. Three months ago, the work on district No 1 (Cuma) was 75 percent complete; district No 2 (Nola), 50 percent; No 3 (Acerra-Pomigliano), 95 percent; No 15 (Regi Lagni), 51 percent for Foce and 24 percent for the collectors; No 24 (Caserta), 17 percent, and 59 percent for the minor projects.

These projects should be more or less complete by the end of 1981. But will they? There is a "deadline" for water treatment in 1986; will it be met?

Unfortunately, past experience is cause for pessimism. The Nola deadline was set for December 1980, and for Regi Lagni, July of this year. For Acerra-Pomigliano, it is October 1980. The latter will certainly be met. The others are not yet on schedule because there are still problems. The Marigliano commune, for example, the Fund says, has asked that certain projects be delayed until the potato and tomato harvest is in. As for Cuma, there has been another delay due to a postponement of the Domiziana crossing till the end of summer, when the road will be clogged with hundreds of thousands of automobiles.

A Casmez expert told me, "This treatment plant has to be grafted onto the old one, with the gallery already built. But we have to put the present Cuma plant out of service, and to do this we have been holding meeting upon meeting with the commune of Naples, Capitaneria di Porta, and Pozzuoli. When it does begin, there will take place for a few months or, in any case, for a limited period of time, what is normally done in emergencies when the main conduit breaks and the effluent flows into La Pietra. And yet it is only a technical problem of the kind that can be solved with a little good will. The real problems are something else; they are decisions prior to the operating phase and refer to plans already made but that can't seem to shake off the problems that are slowing them down. Of course, Minister Capria is ready to go ahead

whenever the local governments are; and the Fund has been charged with presenting a report that the minister will deliver to the CIPE [Inter-ministerial Committee for Economic Planning]. But if the obstacles have not been overcome, that won't be for some time. It might even be in 1986. Then what?"

Yes, and then what? A recent inquiry by the Water and Acqueducts service stated that the Cuma treatment plant will be delayed four years; differing costs have to be studied, increases in planned costs have to be calculated, and certifications have to be filed.

In the case of Nola-Marigliano, the delay has been caused by a long argument between the Fund and the communes involved over location, and also by tax collectors over easements.

In the case of Ischia, the polemic has been going on since 1976; the Ischians have blocked four different solutions (they are worried about making Forio the "garbage heap of the island"), and only recently, after many vicissitudes (some time ago they even shut down the work site of the consortium contracting for the project), other proposals were put forth and concluded with the interested communities, but they have to be approved all over again in order to obtain full financing of the umpteenth contract change.

These are only three examples, but they are illustrative. A few days ago, even Minister Capria spoke of them to the responsible politicians and technicians, saying that he is ready to take on all political responsibility for opening up the situation. If that happens, a great step forward will have been made, at least in the area of water treatment. But this should happen in a very short time; too much time has been wasted already.

[21 Sep 80, pp 1, 2]

[Text] Naples--A couple of years of work and 10 billion lire should be enough to solve the pollution problem in the Gulf of Naples. Prof Mendia, professor of sanitary engineering at the University of Naples, says that the technology is there: any delay is due solely to a lack of will. But pollution of the sea by floating debris left by ships or torn from the coast by storms is only one aspect of pollution. An onshore pollution-control system must be built, and it will take political will power to overcome resistance and obstacles; that is the only solution.

Meanwhile, there is a group of projects planned under the Fund for the South's "Special Project 3" that have been contracted out for some time but that have not yet gotten off the ground because the problems that have stood in the way of these projects for years have not yet been resolved. The projects are the water treatment plants of Ischia, the mouth of the Sarno, and the hospital zone. We shall discuss them.

Concerning Ischia, I said yesterday that after years of argument a better day seems to be dawning. And if there are no more difficulties, work could even begin soon, to the relief of the Ischians and many who are worried about water quality in the affected zone. And even for the mouth of the Sarno, it seems that something is finally under way.

But that is not the whole story. There is another group of projects for which contracts have never been let because no decision has ever been made to do so. Regional Assessor Guido De Martino says the obstacle is a conflict between Casmez and business, and it has not been resolved. And these are basic projects that cannot be done without. These projects are for plants in Naples East (Vesuvian communes, the zone of Eastern Naples, San Giovanni, and Volla, with a total "equivalent" population of about 2 million to be served (theoretically) in 1986); the Naples North plants (for 885,640 "equivalent" inhabitants (in an industrial area) comprising Arzano, Cardito, Casavatore, Casoria Ovest, Crispano, Frattamaggiore, Frattaminore, and Orta di Atella); those in Salerno (for 731,641 "equivalent" inhabitants; those of Caserta (which may be cleared for construction); and those of the middle and upper Sarno basin.

But if these projects do not start very soon, there will be other woes. The more time goes by, the more they will cost; the more contract changes are made, the more money will have to be authorized. And consider that the approval of the Naples East project is dated 6 November 1978; Naples North, 27 September; Caserta, 8 February; and Salerno, 26 July of that year. That is 2 to 2 1/2 years ago.

Meanwhile, water quality has remained what everyone knows it is, and the sanitary situation is very delicate.

It is an extremely difficult situation. People in general are worried about the "dirty sea," but few know what the problems are. Of course, no "lay person" can say, just by looking, whether a stretch of water is polluted by industrial effluent or contains coliform bacteria. The technicians know that sort of thing. But they do see and are disgusted at the immense amounts of glop that is oozing into the gulf, spoiling beaches and cliffs, and they want justice. And they are right. But how many know that apparently pollutive discharges may also contain residues from workshops and factories? How many know that innocent runoff from rains may bring to the sea pollutive elements that are not only composed of coliform bacteria?

We have an analytical table dated May 1979 made by Prof Oppenheimer's team in Naples and Salerno. For the west side of zone Piazza Vittoria, where there is no industry, the indices show zero fecal coliform bacteria and zero fecal streptococci, but they do show traces of chrome (1.305, compared to a safety level of 0.1 recommended by the U.S. National Academy of Sciences); traces of cadmium (0.02, safety level 0.001); traces of lead (0.3, safety level 0.01); traces of copper (0.24, safety level 0.02); traces of nickel (1.8, safety level 0.01); traces of iron (0.56, safety level 2.0); there were no traces of mercury or zinc. And yet the sea in that area is so blue that you would think that the problem of rational anti-pollution measures is something made up by scientists. Poor us!

END OF

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November 25, 1980

D.S.